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AN ECOLOGY OF INSTRUCTIONAL DESIGN: A CASE STUDY OF REAL-WORLD PRACTICES IN THE WORKPLACE

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Dedication

To the women who raised me, for you taught me courage, strength, and resilience.

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Abstract

An Ecology of Instructional Design: A Case Study of Real-World Practices in the Workplace

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This descriptive case study narrates the dynamics of the instructional design process, from project intake to designed product. It describes an instructional designer in her work environment, more specifically in a learning and development organization within a large multinational corporation. I looked at instructional design from an ecological or complex systems approach, which means that the interactions among the agents of the system and their environment were explored. I observed the elements that might help inform and shape instructional design practices—focusing more specifically on the interrelationships among the instructional designer, the product being designed, the target audience, and their environment.

This study used qualitative data collection methods to gather evidence of the relationships among the elements of the instructional design ecology and its environment. The data sources for this study included two semi-structured interviews with the instructional designer, field observations, email communications, and artifacts related to the instructional design process, including

documents created by project managers that were shared with the instructional designer participant.

The results of this study demonstrated that the instructional design process in the real world differ from what prescriptive models of instructional design recommend we follow. Although instructional design process models and approaches inform the instructional design process at a microlevel, a lot of information about the design process is left undiscovered and unexplored if the instructional designer education is based solely on models and approaches. Models and approaches of instructional design alone do not address the skills necessary for an instructional designer to be successful in a work setting. Neither do they offer the skills necessary for instructional designers to navigate the complexities of instructional design environments and projects.

The implications of this study relate to new ways of observing the instructional design practice *in situ*, considerations for instructional design education programs, and the understanding that the instructional design process is a complex, non-linear, dynamic practice.

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CHAPTER 1: INTRODUCTION

If you meet someone who is a nurse and ask him what he does, he is going to tell you that he is a nurse, and that should answer your question. Similarly, nobody seems to question what a criminal lawyer, a dental hygienist, or an auto mechanic really does. If one tells someone "I'm a Math teacher," the conversation will probably continue with "Nice! What grade do you teach?" As a graduate student of instructional design and as a professional instructional designer, however, my experience regarding questions and comments about my studies and career is very different. Innumerous times, when someone asks about my graduate program or my career, I have had to describe what I do. To say "My Ph.D. is in Learning Technologies" or "I'm an instructional designer" is definitely not enough for people outside the field to understand what I do. I have had people imply that I am a computer technician; Many suggest that I am trainer, teaching people how to use computers; Some have considered the idea that I may be a website or graphic designer; others have showed disappointment to find out that I am not a programmer or software developer; And finally, a few have insinuated that my Ph.D. in Learning Technologies is useless since I am an instructional designer—an area completely different from my graduate studies. Thus, the question is: how can I, in 1 minute or less, explain to my interlocutor what instructional designers do without simplifying my profession to the point of devaluing it, misleading my interlocutors, or boring them to tears? Although the above is a personal account of experience, research corroborates the issue (Patry, Brown, Rousseau & Caron, 2015; Sharif & Cho, 2015).

Statement of the Problem

The history of instructional design can be traced back to the early 1900's (Reiser, 2001). Most of the changes and advances in the field were a result of technology advancements in the society, which also impacted developments in the field of educational psychology. From behaviorism to socio-constructivism, learning theories have informed instructional design models and practices, pedagogical approaches and ways of assessing learning. In the 1960s research studies in instructional design emphasized learning theories. From the 1970s to the 1980s the literature focused on the production of instructional design models (Kenny, Zhang, Schwier & Campbell, 2005). In the 1990s, a paradigm shift changed the research focus from instruction to learning (Barr and Tagg, 1995). In the 2000s, with the rapid development of technologies, researchers focused mostly on teacher professional development and how teachers were using technology for classroom instruction. Finally, towards the end of that decade, online learning was a subject in demand. Within all of that history, few studies observed what instructional designers really do in their jobs, or how they go about designing.

There is a body of literature that defends the idea of a discrepancy between the theories of instructional design and what instructional designers really do (e.g. Boling et al., 2017; Sharif & Cho, 2015). Foundational and traditional literatures in instructional design describe the instructional design process as inflexible, deterministic, procedural and performed in well-structured phases (e.g. Jonassen 2008; Rowland, 1993; Yanchar & Gabbitas, 2011). Rowland (1993) claimed that such view is inadequate because it conflicts with the actual practices of instructional design in the workplace. Rowland (1992) claimed,

"we have a large body of literature that describes and prescribes how to design instruction but a poor understanding of what expert instructional designers actually do in practice" (p. 65). Despite the large body of research in instructional design, we know little about the instructional design process *in situ* (Kirschner, Carr & Merrienböer, 2002; Rowland, 1993). Gibbons (2011) and Rowland (1993) suggested that we need more research that investigates the instructional design process as it happens in practice for we do not really know what instructional designers do in the real world. Sharif and Cho (2015) stated that the question of what instructional designers actually do remains unanswered. Boling et al. (2017) indicated that strategies to conduct instructional design are underused because they are created without the understanding of what instructional designers really do in practice.

Saettler (1968) suggested that one of the problems of education is the disconnect between research and practice. Being interdisciplinary, however, instructional design would improve a science of instruction by connecting the areas of philosophy, psychology and technology. Similarly, Reigeluth (1983) saw instructional design as the *linking science* connecting learning theory and educational practices (p. 5). Having effective and efficient ways of designing instruction will improve education (p. 6). On the problems of higher education, Fink (2003) argued that lack of good course design is one of the major problems impacting teaching and learning. He proposed that sound instructional design could solve classroom problems and inform curriculum design. At the same time, he understood instructional design as the "missing link" that can bring together pedagogy and institutional changes (p. 25). In reflecting on the proper study of instructional design, Merrill (in Reiser & Dempsey, 2007) pointed out that instructional design products are ineffective and

inefficient because they are designed with insufficient consideration of instructional design theory, the systematic process of instructional design. He explained that most instructional designers in corporate America are "designers-by-assignment," professionals who do not have the proper study of instructional design. In fact, Merrill claimed that "95% of all instructional design is done by designers-by-assignment" (p. 2). He then questioned, "[i]f companies are actually decreasing the number of instructional designers on their staffs and increasing the number of designers-by-assignment then what is the unique role of [students of instructional design]?" Merrill then suggested that universities should start reconsidering what to teach in instructional design programs to better serve the realities of instructional design in the workplace. Cennamo and Kalk (2005) claimed that higher demands for "implementation of computer-based learning systems require sophisticated course development" (p. xiii). Therefore, there is a need for formally trained and experienced instructional designers to fulfill those demands. Because many of the professional instructional designers active in the market do not have a formal background in instructional design, it is important to explore real-world practices of instructional design to offer the newcomers a solid foundation and guide to ensure their practices and final products are successful. Richey (1998) claimed that one way to help close the gap between research and practice would be by producing research that observes the instructional design process in natural settings (p. 13). Le Dantec (2009) argued that notions of situated cognition are necessary for a better understanding of the design process. From the establishment of instructional design as a field of inquiry until today, the question of what instructional designers really do seems to remain unanswered. The significance, then, of

this study lies in its attempt to observe instructional design as it happens in a natural setting to show a more complete picture of the instructional design work.

Purpose of the Study

The purpose of this research was to study the dynamics of the instructional design process by observing an instructional designer in her work environment, more specifically in a learning and development (L&D) organization within a large multinational corporation. I adopted theories of complexity as a framework to observe instructional design as a situated cognitive process, deeply embedded in its social contexts. I hope to contribute to the literature with empirical research and a rich description of what instructional designers really do in the real world.

This study is not intended to be another instructional design model. Instead, it looks into the instructional process from a perspective different from the predominant one with the intent to narrow the gap between instructional design theory and practice and inform newcomers of the realities of the world of instructional design beyond the pages of books and the walls of academia.

Research Question

After years studying different teaching methods, how people learn, different instructional and learning technologies, we already know a lot about instructional design, but we still have so much to learn (Gustafson in Cennamo and Kalk, 2005, p. xii). We know when instructional design started to solidify as a standardized process and a field of inquiry. We know different models of instructional design and how studies on learning theories have given rise to those models. We know how technology has shaped our social practices,

and how some technologies have been and are being used for teaching and learning. We know some of our greatest achievements in education. We know some of the limitations of our classroom and educational system. Why do we not know what instructional designers actually do? How can instructional designers answer the question "what do you do?" with confidence and clarity? How can graduate programs in instructional design better prepare their graduate students for the realities of the workplace? And how can we ensure that instructional design practices are adequate to produce quality learning products and environments?

Before we can offer answers to the questions above, we must first understand what instructional designers really do in their work environments. Thus, in this study I observed the instructional design process from project intake to the designed product in a learning and development (L&D) organization within a large multinational corporation. I looked at instructional design from an ecological or complex systems approach, which means that the interactions among the agents of the system and their environment were explored. The predominant literature has tried to respond to the complexity of the instructional design process by taking it apart and presenting it as step-by-step models and procedures. However, that simplification has caused a misrepresentation of what instructional design really entails, and it does not help narrow the gap between theory and practice. Therefore, I argued that instructional design models represent and inform what instructional designers do at a micro level. In order to capture a more realistic picture of instructional design practices, an ecological approach offers a more robust framework.

The goal of this study was to describe the dynamics of an ecology of instructional design. To achieve its goal, I observed the elements that might help inform and shape instructional design practices—focusing more specifically on the interrelationships among the instructional designer, the product being designed, the target audience, and their environment. Considering that the setting was a learning and development (L&D) organization within a large multinational corporation, I set out to answer the following question:

- How do instructional designers design from project intake to designed product?

To answer that question, I described:

- The contexts of the instructional designer, the target audience and the product being designed.
- How the design process was distributed or coordinated across the instructional design ecology.
- How the instructional designer adapted the process and/or the product being designed to the needs, expectations and demands of the design context.
- How the embodied aspects of the instructional designer, the target audience and the product being designed informed the design process.
- How the instructional design process was enacted—observable types of situated practices or activities in which instructional designer or learners engage to inform the design process.

Definition of Terms

Instructional design as a field of inquiry has separated itself from the field of design in general (e.g. engineering and architecture). Few authors in the field of instructional design suggest that we look at the larger body of literature in design and start aligning our views.

Design. "Design is a disciplined inquiry engaged in for the purpose of creating some new thing of practical utility. It involves exploring an ill-defined situation, finding—as well as solving—a problem(s), and specifying ways to effect change" (Rowland, 1993, p. 80).

Speaking of instructional technology, Reiser (in Gagné, 1987) stated, "[t]he term instructional technology has meant and will continue to mean different things to different people" (p. 11). Therefore, I found it necessary to present a definition of instructional design.

Instructional design and technology.

> [It] encompasses the analysis of learning and performance problems, and the design, development, implementation, evaluation and management of instructional and non-instructional processes and resources intended to improve learning and performance in a variety of settings, particular educational institutions and the workplace (Reiser in Reiser & Dempsey, 2018, p. 5).

This definition includes the concept of design as well as the idea of using technology for teaching and learning.

Finally, instructional designers create many products to aid both instruction and learning: curricula, online courses, trainer guides, educational games, simulations, and instructional videos, to name a few. Throughout this study, I will be referring to the products created by instructional designers—mostly learner-facing materials and less instructor- or teacher-facing materials. This idea does not deny the fact that instructional designers also design learning environments.

Learning product. It will be also referred to as object of design, object being designed, product being designed and design product.

CHAPTER 2: LITERATURE REVIEW

The first part of this chapter summarizes the literature on studies that investigated what instructional designers do in practice. Next, I present the framework of complex systems and how it can be applied to an ecology of instructional design.

What Do Instructional Designers Do?

Literature in the field of instructional design and technology suggests that research on the practice of designing instruction has focused predominantly on theory. The lack of empirical studies that observe instructional designers in their natural settings leads to a gap between theory and practice. Rowland (1992) argued that what we know about instructional designers' practices are mostly assumptions. Experts recommend best practices for successful instructional design through models and principles without fully understanding what instructional designers actually do at work. The few data-based studies collected used surveys and reflective interviews as tools for instructional designers to self-report their practices and rationalize their choices and decisions.

CONCEPTUAL STUDIES

Articles that proposed conceptual solutions for the instructional design literature shortfalls shared common explanations and concerns about the problem of disconnect between instructional design models and practices. The first consensus is that the literature presents instructional design as a set of step-by-step procedures to be followed in a logical and deterministic way (Jonassen 2008; Rowland, 1993; Wilson, 1995). Instructional design models are mostly prescriptive and recommend what instructional designers should do to design successful products. If the design process or designed product is not successful, the

instructional designer is guilty of not knowing how to correctly implement the model. Criticism arises from the position that prescriptive models do not represent the reality of the instructional design work, and therefore are not easily transferred from theory to practice.

According to Rowland (1993), for instructional design to be successful, it is necessary to reconsider the way we understand instructional design. He proposed that instructional design is a type of design, is both a systematic and a creative process, and includes problem solving and "requires high-level cognitive processes" (p. 89). Borrowing from the literature of engineering and architectural design, Rowland (1993) presented factors that shape the design process, such as the designer's skills and experiences, the conditions in which design takes place, including the environment, the object being designed, and the relationships between designer and stakeholders. Referencing the literature in instructional design, he concluded that instructional design is "better characterized as situated actions taken in response to moment-moment conditions than pre-determined steps," and that prescriptive theories can be used as "heuristics for deriving a solution" to design problems (p. 89).

Although acknowledging that instructional design models can be inflexible and indifferent to the complexities of real-world instructional design practices, Wilson (1995) claimed that those models are successful as project management tools, ". . . monitoring work and ensuring accountability are handled by a set of checkpoints or signoffs . . ." (p. 6). He proposed guidelines for constructivist practices of instructional design based on concepts of situated cognition, emphasizing that the environment shapes the choices and

decisions instructional designers make, and recommending that instructional designers include the target audience in the design decisions.

Gibbons (2003) discussed the concept of "centrisms" in instructional design practices. Then, he explained the layers of design, and argued that instructional designers change their practices over time by focusing on the layers with which they are more familiar. As they learn and gain experiences, instructional designers do not abandon old views of design, but incorporate new layers to their knowledge base, adding to their ability to make more refined and well-informed design decisions.

Silber (2007) argued that what instructional designers do is similar to what designers in other fields do. He presented a principle-based model that understands instructional design as a problem-solving process consisting of a non-linear set of principles and heuristics to help expert designers build mental models. He condemned the current practices of instructional design teaching which acknowledge instructional design as a set of linear steps first, and then try to explain the complexities of the process later—"teaching well-structured procedures and then expecting the learner to generalize to new ill-structured problem situations either does NOT work at wall, or is extremely inefficient" (p. 11).

Another model presented attempts to support instructional designers decision-making processes by integrating two frameworks from other design fields: a content-model and a context-model of design. The integrated model considered three levels of design content within the complexities of work contexts (Young, 2008).

Borrowing from the literature in other fields of design, Jonassen (2008) proposed a model in which instructional design is understood as problem solving in which designers' main role is to make decisions in iterative cycles (p. 23). Under this model, analysis is a constant in design rather than a phase. To be successful, the instructional designer must understand that each cycle provides a series of situational constraints, and those must be analyzed in order to be identified. Then, the designer must make decisions and explain through "appropriate theories, empirical research, or previous experience" why those decisions were made (p. 26). If current decisions contradict previously made decisions, a rationale must be provided. Finally, this model also challenges the instructional designer to disclose the personal beliefs as well as organizational beliefs that influence each decision.

Gibbons (2011) considered that in current instructional design practices, the object of design is defined in terms of the delivery medium (e.g. web-based learning), enactment (e.g. simulation and role-play), or instructional strategy (e.g. problem-based learning). He claimed that when instructional designers do not have understanding of design contexts, predominant philosophical views and the latest trends in technology tend to influence their design decisions. Using the literature from other fields of design, Gibbons (2011) described two design contexts that are relevant to instructional design. The first one examines the level of social commitment of the designer and how such level is reflected in the designed products. That is, when the designer commits to his or her social role, the designed object also allows for learners to engage in social interactions and become more relevant to their contexts. The second view considers hierarchies within the contexts of design—projects

and organization. By understanding the context, instructional designers will know the problems that they can and cannot solve, and when to escalate to an upper management level. That makes designers aware of the possible barriers they may encounter, the scope of their authority and possible solutions for the hierarchy constraints. Gibbons (2011) suggested that such view empowers instructional designers to negotiate the design contexts, rather than design within them, which gives them a much larger role in the design context as one to also have a say in the decisions at a macro level of the environment.

Honebein and Sink (2012) shared the concept of an eclectic practice of instructional design and argued that when instructional designers are not attached to a single theory, they can design better learning products.

Contrarily, Yanchar and Gabbitas (2011) acknowledged that there is a common theoretical orthodoxy in the field of instructional design and argued that eclecticism is not a productive alternative to the problem of rigid attachment to one model or theory. According to Yanchar and Gabbitas (2011), eclecticism is criticized by its lack of clear judgment or assumptions that underlie instructional design decisions. Instead, they proposed the concept of *critical flexibility*. The authors presented the idea of "tacit knowledge and accumulated experience," to consider that design decisions are usually made based on "situational constraints such as budgets, timelines, organizational policies and client demands" (p. 385). With *critical flexibility*, the authors challenge instructional designers to confront their own beliefs and assumptions and make adjustments to the design based on conceptual tools—learning and design theories.

Sharif and Cho (2015) acknowledged the existence of instructional design models that are cyclical, iterative, or simply less procedural, such as rapid prototyping and ASSURE. However, they suggested that many of the newer instructional design models also stem from ADDIE. The authors stated that "model-centric approaches fail to address the broader scope of instructional design knowledge" (p. 81). They recommended that instructional designers form a community of practice at work so they can build a more collaborative practice and continue learning and evolving together with the field of instructional design and its practices.

DATA-BASED STUDIES

The few data-based articles identified also shared a common concern: what do instructional designers do in practice, or do instructional designers use instructional design models in their practices?

Rowland (1992) gave 8 participants—4 novices and 4 experts— a design task and asked them to think aloud as they created an outline of the solution. Results of the study indicated that novices and experts practice instructional design differently. While novices interpreted the problem as well structured, expert designers perceived them as ill structured. As a consequence, novices committed to a solution early on in the process in spite of not having all the information whereas experts "delayed their commitment pending a deeper understanding of the problem" (p. 76). In addition, novices broke down the problem into two parts at a basic level. The expert designers, on the other hand, analyzed the problem further considering knowledge relationships as the root cause of the problem.

Finally, expert designers used learning theories and design principles to ask what if questions and derive potential solutions.

In their first experiment, Kirschner, Carr and Merriënboer (2002) gave a list of instructional design principles to professional instructional designers and asked them to choose the ones that were most important to successful design, and the ones that needed improvement. Participants came from two distinct contexts—academia and the business. The results of this experiment demonstrated the importance of context in design decision making. The instructional designers from the business focused on principles that addressed the importance of relationships between the instructional designer and stakeholders. In the second experiment, the same participants were given a design task, and used an Object-Action sheet to indicate the order of actions they would take to achieve design a solution. Results of the both experiments confirm the literature arguments that there is a gap between the practice of the instructional design process and the models that inform it.

A study of 24 expert instructional designers from six different contexts compared the design processes they utilized to four research paradigms that influence instructional design theories (Visscher-Voerman & Gustafson, 2004). Results from interviews and design document analysis revealed that there was no clear order of conducting the instructional design process as present in ADDIE models. When comparing the results across participants, the researchers also observed that there was no clear pattern of design process. They, then, requested that the participants provided a rationale to justify their decisions. This strategy demonstrated that "designers had completely different conceptions of what they called a good design and what constituted a good design process" (p. 76). As

the participants' rationales were conflicting, Visscher-Voerman and Gustafson (2004) relied on the literature of design paradigms to further analyze their data. Results of the analysis corroborated previous assertions that the instrumental paradigm is predominant in instructional design literature and practice.

A survey instrument asked 113 instructional designers how often they used instructional design or learning theories and other 10 design strategies to make instructional strategy decisions. The survey also asked participants how frequently they used sources of knowledge of instructional design theories and practices to stay informed, and to respond to statements contrasting objectivist versus constructivist assumptions (Christensen & Ogusthorpe, 2004, p. 45). Results of the study revealed that instructional designers learn about new theories and make instructional strategy decisions by talking to their peers. Also, less than 50% of the respondents indicated they use learning and design theories to make decisions, and the majority indicated to be eclectic in their choices.

Dicks and Ives (2008) investigated eight professional instructional designers at work—a Medical-Doctoral University. Participants provided reflections of their practices and answered interview questions. The results revealed that instructional designers used cognitive and social tools daily to negotiate the design with their clients and design the instruction. The researchers noted that although cognitive and social skills are important for successful instructional design, the instructional design theories do not heed those skills.

Through a set of semi-structured interviews, Yanchar, South, Williams, Allen and Wilson (2010) examined how professional instructional designers practice their craft.

Seven instructional designers from four distinct contexts participated in the study. Results of the interview indicated that instructional designers like to use theories as rationales for their design. However, only a limited number of theories are utilized to inform the designers' decisions. The researchers also observed that the participants did not differentiate between learning theories, instructional design models and instructional design process. Finally, this study revealed that instructional designers usually default to eclectic practices and justify their decisions on intuition and experience in the field (p. 57).

A yearlong case study observed all the activities that an instructional designer performed at a university to understand the instructional designer's practices, roles and collaboration skills (Sugar & Moore, 2015). A self-report activity log and seven semi-structured interviews were utilized for data collection. The results of this study revealed that the instructional designer performed several activities beyond design such as production of instructional media and support of a Learning Management System (LMS). The list of roles the instructional designer played also went beyond the role of a designer (e.g. trainer). Finally, some clients reported on the instructional designer's skills indicating the importance of ability to collaborate for successful instructional design.

Through brief descriptions of an instructional design project, transcription of dialogs and participants' meta-reflection, Gerin-Lajoie (2015) used case study to report on an instructional designer working with faculty member to implement two online art courses at a Canadian university. Although the university recommends adapting Gagné and Briggs (1979) model as an instructional design approach, the use of the model is not mandatory. One of the instructional design issues raised by the study was the importance of

communication between the instructional designer and the client, who was a faculty member. Had this study focused on the application of the model itself, we would have missed a contextual element that is usually not addressed by instructional design models—the importance of communication between instructional designer and client.

Similarly, Patry, Brown, Rousseau and Caron (2015) observed an instructional design team in a Canadian university working with a group of faculty members who were also the project SMEs and clients. Through brief descriptions and transcription of dialogs, their case study reported that Gagné and Briggs (1979) model was used for project milestones. The study also highlighted some contextual issues encountered during the project—clients' lack of understanding of what instructional designers do, project scope and deadlines, and personnel turnover. If the project had addressed the instructional design model without contextual information, the issues raised during the project would have been missed.

Campbell, Schwier and Kenny (2015) used a narrative inquiry to tell the story of how instructional designers design. They demonstrated that instructional designers do not work in isolation. Instead, they show that instructional design practices exist in social contexts and that instructional designers collaborate with clients and SMEs, and through those relationships and experiences, they make meaning and build knowledge. The authors claimed that conventional literature in instructional design focuses on process, and that although instructional designers may use conventional instructional design approaches, their practices vary depending on contexts. Finally, they stated that "key aspects of instructional design have been overlooked in conventional literature" (p. 51).

SUMMARY

The literature reviewed above makes great contribution to the field of instructional design. All studies referenced indicated a gap between instructional design theories and practices and advocated for empirical research that can reveal what instructional designers actually do in the workplace to help inform theory and narrow the gap between theory and practice. Most of the conceptual studies aligned and provided sound argument for the case of instructional design as an activity that involves problem solving and decision-making, and that context plays a major role in the instructional designers' practices. Equally, the data-based articles provided the field with great insights about what instructional designers actually do at work by utilizing a variety of research methods and including a diverse body of participants.

Yet, there is a great deal of research that is still needed to help paint a more accurate picture of instructional design in natural settings. Most of the conceptual articles criticized the current literature for providing experts assumptions of best practices. However, those same articles stayed at the conceptual level and also provided guidelines or models of good instructional design. The data-based articles, although empirical, used self-reporting strategies for data collection opening the doors for other questions: are instructional designers self-perception an accurate description of their actual practices? Literature about teachers' beliefs explains that there is a difference between what teachers' say they do, and what they actually do in the classroom (Ertmer, 2005). The same can be true when instructional designers self-report on their practices, values and beliefs. The only way to

resolve this problem is by offering research that goes beyond self-report and reflection. Yanchar et al. (2010) argued that research "will require means beyond survey items and reflective interviews to understand the dynamics of design practice" (p. 58).

Finally, even the studies that claimed to consider the contexts of instructional design and the relationships between designers and other project team members focused on the instructional designer, their decisions and thinking processes rather than on the context and the relationships. In short, they focused on the fragmented pieces of the system, not on actual relationships among the elements of the system. That can be seen from the research questions that most studies tried to answer: do instructional designers use theory for their practices? The following section will offer an overview of the literature of complex systems theories to propose complex systems as a framework for understanding an ecology of instructional design.

Theoretical Framework

COMPLEX SYSTEMS

Theories of complexity are interdisciplinary and have been used to study complex systems in economics, biology, physics, philosophy and cognitive science to name a few disciplines. Although there is a growing interest in a science of complex systems, there is no one single definition of a complex system. Instead, a complex system is characterized and explained by its properties. Holland (1995) advocated for the importance of cross-disciplinary comparisons "in hopes of extracting common characteristics" (p. 6).

The fields of biology and engineering have long used the concept of systems. As we understand it, a system is a collection of components that work together interdependently to form a whole. Not all systems are complex, however. Complexity depends on the many ways in which the components of the system interact, allowing "the system to undergo *spontaneous self-organization* (Waldrop, 1993, p. 11). Even when the components are basic and the rules of operation are simple, a system can still be complex. As Waldrop (1993) explained, ". . . complexity arises because you have a great many of these simple components interacting simultaneously. The complexity is actually in the organization—the myriad possible ways that the components of the system can interact" (p. 86).

Elucidating the case of complexity, Waldrop (1993) stated,

> Thus, people trying to satisfy their material needs unconsciously organize themselves into an economy through myriad individual acts of buying and selling; it happens without anyone being in charge or consciously planning it. The genes in a developing embryo organize themselves in one way to make a liver cell and in another way to make a muscle cell. . . . Atoms search for a minimum energy state by forming chemical bonds with each other, thereby organizing themselves into structures known as molecules. In every case, groups of agents seeking mutual accommodation and self-consistency somehow manage to transcend themselves, acquiring collective properties such as life, though and purpose that they might never have possessed individually (p. 11).

Besides self-organizing, complex systems are *adaptive*. They can adapt to changes in their environment and learn from their errors to increase their chances of survival. ". . . they don't just passively respond to events the way a rock might roll around in an earthquake. They actively try to turn whatever happens to their advantage" (Waldrop, 1993, p. 11). Corporations and industries are complex systems which are always adapting to changes in the markets and the economy.

Complex systems are also *dynamic*. The interactions within the system happen simultaneously. Let us consider a technology company. While the engineers are producing new products, the human resources team is hiring and firing employees, whereas the cleaning crew is cleaning the common areas of the corporate office. In a city, even when everybody is sleeping, doctors and nurses in a hospital are working while the police are also doing their job protecting and arresting people. In a family, even when all the family members are sleeping, the dynamics of the family is still very much alive. A mother does not cease being a mother because she is sleeping. Also, the fact that all members of the family are sleeping is an interaction in itself. This interaction may bring about a possible state of tranquility allowing the family members to recharge and be ready for the next day.

Because the interactions in a complex system happen in parallel to each other, it is hard to calculate their effect in a linear way. Therefore, we say that a complex system is nonlinear. *Nonlinearity* causes the system to be unpredictable because their relationships "do not produce a proportional effect" (Meadows, 2008, p. 91). That is, in a complex system the whole is greater than the sum of its parts. Let us go back to the example of the family whose members are sleeping. One might say that because they are all sleeping, the

effect of their activity is linear—everybody will be rested the next day. But what if one of the family members, the son, has a bad dream because earlier that day he witnessed his parents engaging in a fight? We can argue that his fear of seeing his parents get divorced impact his ability to sleep well, and therefore he will not wake up rested the next day. This was an example of how dynamic, spontaneous, nonlinear and unpredictable a complex system can be. The nonlinearity property may cause the complex system to appear chaotic. However, researchers have demonstrated how complex systems are actually structured and coherent. If we go back to our previous example of a city, we can experience coherence every day in that complex system despite its unpredictability. We cannot say for sure when there will be a murder, for example. And when a murder happens, it may cause shock and disbelief to some of the city members. Still, it is not completely illogical that there is violence in the city, especially if it is a big city—because the relationships among its parts are more complex.

> . . . all these complex systems have somehow acquired the ability to bring order and chaos into a special kind of balance. This balance point—often called *the edge of chaos*—is where the components of a system never quite lock into place, and yet never quite dissolve into turbulence, either. The edge of chaos is where life has enough stability to sustain itself and enough creativity to deserve the name of life (Waldrop, 1993, p. 12).

In fact, a prolonged sense of stability may cause problems to the system. In the 1990s, a study investigated the high level of alcoholism in the population of a small island

belonging to Brazil. The archipelago of Fernando de Noronha has 21 islands, and it is known for being a piece of paradise because of its beautiful beaches and rich ecosystem. The study reported that the economy in the islands of Fernando de Noronha is supported by tourism. Due to strict environmental protection laws, not much could be developed on the islands. As an example, the article reported a case of a couple that got divorced, but continued living in the same house because they could not find another place to live, and could not build another structure in their backyard without the thorough consideration of the organizations that protect the ecosystem there. Years had already passed, and the divorced couple still lived under the same roof. The study concluded that the laws protecting the environment were so strict that Fernando de Noronha was not developing. The islands' residents were feeling stagnant and were resorting to drinking to abate the sense of boredom. The account above illustrates the need of the system to be continuously dynamic, interacting within an environment that is ever changing. According to John Holland (in Waldrop, 1993), stability "is death; somehow the world has to adapt itself to a condition of perpetual novelty, at the edge of chaos" (p. 356).

ECOLOGY

In spite of a lack of a single definition of complex systems, researchers agree that complex systems can exist within a larger system. A family is a complex system that exists in a neighborhood that exists in a city within a state within a country within global economies and so on. Banathy (1968) explained this concept by differentiating subsystems from suprasystems. "Systems operate in the larger context of their environment. This larger context can be conceived as the suprasystem of a particular system" (p. 6). A suprasystem

encompasses a subsystem and interacts with it. Although a subsystem has to serve the goal of the suprasystem, the subsystem can still be understood as autonomous—it is self-governing, has internal coherence, and it works towards its own maintenance. Boulding (1981) spoke of three inter-acting and interdependent systems—physical, biological and social. "Each has much internal coherence and its own special characteristics; nevertheless, the three processes constantly interact" (Boulding, 1981, p. 30). Holland (1995), studied *complex adaptive systems* (*cas*). "*Cas* are, without exception, made up of large numbers of active elements that, . . . , are diverse in both form and capability" (p. 6). He illustrated the concept of *cas* with "the great array of firms in New York City" (Holland, 1995, p. 6). Finally, Bateson (1972) defined a healthy ecology of human civilization:

> A single system of *environment combined with high human civilization* in which the flexibility of the civilization shall match that of the environment to create an ongoing complex system, open-ended for slow change of even basic (hard-programmed) characteristics (p. 495).

I would argue that instructional designers, their target audience (or learners), and the instructional designer deliverables (courses or other learning products) constitute an adaptive, self-organizing, and dynamic complex system. Furthermore, they are situated in and interact with a larger system formed of instructional design agents (people, objects and technologies), practices, values and structures (physical and organizational) in a specific environment. This, I will call an ecology of instructional design. An ecology of instructional design is a complex system of interrelationships where interconnected agents

act and interact simultaneously, co-constructing their environment. Ecology implies diversity, evolution, adaptation, nonlinearity and hierarchy.

In an ecology of instructional design, diversity of values, knowledge, experiences and technologies allows the system to be more robust, giving it better chances of adaptation in the face of unpredicted changes. Therefore, diversity is crucial for the health of the ecology (Bateson 1972; Nardi & O'Day, 1999). Evolution is also key for a healthy ecology. As the agents respond to the changes in the environment, they learn, adapt and evolve. It is a dynamic relationship—the agents adapt to the environment, and at the same time, transform it. In instructional design, we can see evolution in our changes from focus on the instructor to focus on the learner, in the technologies used for teaching and learning, and the products designed for learning (e.g. educational games). Changes in the understanding of how people learn have transformed the practices, technologies and products of instructional design demanding an evolution in the ecology. Instructional design ecologies that can adapt to those changes improve their chances of survival. Finally, hierarchy exists to set boundaries to the transactions between the agents of the system and the environment (Bateson, 1972, p. 496). In studies of ecosystems in biology, hierarchies provide a framework that makes the unit of analysis (the system) more manageable to study. According to Holland (2006), all ecologies "have a hierarchical organization of boundaries enclosing boundaries, with signals that are attuned to those boundaries" (p. 6). It is the same concept of nested hierarchy used in biology, and Banathy's (1968) concept of subsystems contained in a suprasystem. The challenge, however, is where to set the

boundaries—". . . there is as yet no theory or general model that tells us what mechanisms are sufficient for the formation of boundaries . . ." (Holland, 2006, p. 6).

Let us consider an instructional design scenario: an instructional designer designing a self-guided training (SGT)—also known as self-guided course or self-paced course—to be delivered via a learning management system (LMS). Traditional literature in instructional design considers the instructional designer, the object to be designed and the learner (or target audience) in the design situation. The instructional designer starts the design after an analysis and goes through an iterative process to design the SGT. During the design and development phases of the process, she usually interacts with a subject-matter expert (SME) and a media specialist or maybe a developer. Once it is ready, the SGT will be posted in the LMS and the learners can take the training. This is a very simplistic idea of instructional design and it communicates an extremely limited view of it. In an ecology of instructional design, however, the focus will shift from the elements of the design situation to the simultaneous interrelationships between the elements of the system. In an instructional design ecology, the interconnections and interactions between the people, the SGT, the technologies and the environment is where complexity lies, and therefore, those would have to be observed so that we could have a deeper understanding of how the SGT emerges. That is, how the elements interact with each other and with the constraints and guidance of the environment becomes more relevant than the individual elements themselves. We would consider the instructional designer's interaction with the technologies that aid and support the writing and the design processes. We would consider how the instructional designer acts and interacts with the SGT by responding to the

contexts of the learners, the feedback from the SMEs, and the constraints of the technologies. We would also situate the act of designing in the social structures at the individual and the organizational levels—the instructional designer's relationship with the SME and with the politics of design stipulated by the organization, for example. We would probably have to situate the act of designing in the historical constructions of the organization, the social relations, the design practices and the technologies.

Similarly, we would observe how the learners contribute to the design of the SGT. In an instructional design ecology, the learners are not just recipients of training. As Wenger (2008) proposed, designing for learning cannot be based on a duality between the designer and the learner. Instead, successful learning design requires involving the learners in the design of a course or other system of learning (p. 234). Although the above was an abridged version of what a study of an instructional design ecology could comprise, it demonstrates that instructional design is indeed a very complex practice.

We have summarized some of the vocabulary and concepts in complex systems and ecology. But how can we study a complex system? What is the framework that can guide and support research on the complexity of instructional design? Cross-disciplinary studies on complex systems have started to form a vocabulary and an understanding of common patterns, principles, and attributes of a complex system. For the purpose of this study, I will use the following attributes to guide my observation of an ecology of instructional design: *distribution*, *emergence*, *embodiment*, and *enaction*.

DISTRIBUTION

To understand the concept of distribution, we can use a biological example about the functions of the kidneys. What do the kidneys do? One cannot understand the kidneys for the kidneys themselves. The kidneys can only be explained and understood through the relationships and interactions they have with other organs and systems in the body. No one can talk about the kidneys without talking about the blood. No one can understand the kidneys without explaining their interrelationships and interactions in the urinary system. Although the kidneys have a function, their function cannot be realized without coordination with other parts of the body. Therefore, we say that the functions of the kidneys are distributed among the other parts of the urinary system.

Considering distribution in an ecology of instructional design implies that design is a cognitive process. In a cognitive process as well as in a complex system, processes are *distributed* among the elements of the system and the environment. In short, there is not a "control center" in a complex system — "the control of a complex system tends to be highly dispersed" (Waldrop, 1993, p. 145). If a system were to have top-down rules dictating exactly how the elements should interact, this aggregate would be too orderly, not dynamic, and therefore, less likely to adapt, decreasing its chances of survival. In the other extreme, if the system's only rules came from the bottom up, this aggregate would be too chaotic also with less chances of survival. Holland (in Waldrop, 1993) argued that there needs to be a balance between top-down and bottom-up rules in order for complexity to exist. Being in the edge of chaos means that the system is not in perfect order or in total chaos: Order → Complexity → Chaos.

Hutchins (1995) demonstrated how cognition is distributed among individuals, tools and the environment, and across its spatial, temporal and social dimensions. He also exemplified how top-down and bottom-up processes were coordinated adding to the complexity of the system. Similar patterns in Hutchins' (1995) system can be found in a classroom situation. Let us assume that the goal of the lesson is for the students to learn about the solar system. The teacher's knowledge of the solar system can be seen distributed among the whiteboard and worksheets that he created. At the same time that the teacher is sharing his knowledge of the solar system, students may be distributing what they are learning and already know among notebooks and computer screens. At specific moments, we can see the teacher telling students what to do (top-down rules). At other times, the teacher adapts the pace of the class to accommodate the students' needs (bottom-up rules). We can also see processes distributed across the physical space of the classroom. Because this teacher believes in collaborative work and social learning, he organizes the desks in a circle. The temporal distribution of knowledge can be observed in the elaborate materials that the teacher uses to teach the content. That is, his previous experiences with the content have allowed him to learn and improve the quality of the materials to fit the students' needs more adequately in the present. Although education is usually studied as a system that includes teachers, learners, curriculum, books and other elements, and educational policies and schools and school districts composing the environment, traditional theories of instructional design tend to be more rigid, deterministic and prescriptive when they address the actual design practices. From less traditional schools of thought, we have started to form a body of literature that considers contexts of instructional design indicating a view

of instructional design as part of a social system. However, those research studies usually isolate the parts of the system and investigate those parts independently.

Concepts of distributed cognition as well as situated cognition provide a framework that support the understanding of cognitive processes dependent on social interactions and determined by activities situated in social, cultural and physical contexts (Hutchins, 1995; Lave, 1988). Distributed cognition conceives that cognition is shared (distributed and coordinated) across the entire network of individuals, artifacts and the environment. And if cognition is distributed, it is also situated in the environment, bound to the social and physical affordances of the situation (Solomon, 1993, p. 114). These concepts can also be applied to support the idea of instructional design as a complex activity system, in which knowledge and work are distributed across groups of people and adjusted to the "different kinds of activity, with their different forms of mediation, division of labor, social rules, and so on" (Cole & Engeström in Solomon, 1993, p. 42).

By focusing on the rigid prescriptions of the design steps or on the disconnected elements of the instructional design system, we have overlooked convincing evidence that instructional design is a complex system, which exists within an ecology of social and environmental contexts that shape what the instructional designer is able to think, feel and design, and that is also co-constructed by the instructional designer's responses to the structures of those contexts. Similar to the example of the lesson on the solar system above, instructional design interacts with the affordances and constraints of its physical environment: the computer hardware and software available for the design activity, the physical or virtual spaces of meeting rooms, the organization of the design space whether

the instructional designer works in an office or from home. The object designed says a lot about the environment in which it was designed. An educational game indicates that the instructional designer had the resources of technology, skills and time to develop that learning product. The technologies used for designing also say something about the designer. Some instructional designers start with an outline created with pen and paper; others may use mind map software to brainstorm ideas for the final deliverable. In this case, complexity does not exist in the head of the instructional designer, but in the distribution of the design activity between the instructional designer's mind and mediating structures offered by the environment (Pea in Solomon, 1993).

With the concept of distribution, we understand how the system (cognition and activity) is coordinated across the interactions and relationships among individuals, artifact (or mediating tools) and the environment—all happening simultaneously. Next, we are going to explore how these processes emerge.

EMERGENCE

Emergence is a self-regulatory property of the systems' internal dynamics. It allows for the system to continuously rearrange and organize itself into new complex structures (Waldrop, 1993). Through emergence, complex systems learn, become more diverse and complex, and therefore, evolve (Meadows, 2008, p. 78). Because the product of emergence is the system itself, there is no separation between the producer (the system) and the product it creates (the system itself). This is called autopoiesis organization (Maturana & Varela, 1992, p. 49). According to Varela, Thompson and Rosch (1993), "[t]here is no unified formal theory of emergent properties. It is clear, however, that emergent properties have

been found across all domains—vortices and lasers, chemical oscillations, genetic networks, developmental patterns, populations genetics, immune networks, ecology, and geophysics" (p. 88).

Emergence is possible through the relationships between the elements of the system and the environment, more specifically, through input from the environment (Waldrop, 1993). In short, the system receives input from the environment, adapts itself, and sends an output to the environment in this constant flow of information generating feedback. One way of considering emergence in ecologies of instructional design is through the advancements of technology in society. The advent of the Internet (input), for example, required that instructional design ecologies self-organized to include design and teaching and learning practices with the Internet (output). The same happened with the rise of mobile devices (input)—a whole new area of m-learning evolved (output) and impacted instructional design ecologies. Varela, Thompson and Rosch (1993) rejected the idea of input/output for living systems. Instead, they argued that emergence "is the result of the organization and history of the system itself" (p. 157).

In spite of the criticism of the idea of input/output, it is important to notice that the examples provided above offer more evidence that instructional design does not happen in a vacuum. Instructional design is situated in sociocultural practices and conditioned by the physical environment. This ability of the agents to reorganize the system adds to the properties of adaption through learning. As the system learns, it develops the ability to anticipate events. Holland (1995; 2006) used conditional action (IF/THEN) to explain the close relationships between the agents and the environment, and how the system can

anticipate changes. Anticipation is not explained as the ability to predict input from the environment. In fact, emergence reinforces the unpredictability of complex systems. Anticipation is a more fluid concept that can be observed in the system through accumulation of learned experiences. In an ecology of instructional design, an experienced instructional designer can formulate conditional actions to navigate through the constraints and affordances of the environment and the technologies, and to negotiate relationships.

If the system is dynamic and ever changing, why is it not chaotic? Emergence is also related to that space in between order and chaos, complexity. And it happens spontaneously as an "incessant urge of complex systems to organize themselves into patterns" (Waldrop, 1993, p. 118). These patterns, however, are not fixed because the system is constantly transforming itself. If we look at the history of the field of instructional design, we can observe emergence coming about through the new perspectives on teaching and learning theories and technology innovations. Those changes happened at a more "global" level. At more local levels of instructional design ecologies, emergence can be implied through the outputs of the systems. In terms of theories, we have seen waves of designs of problem-based learning, project-based learning and collaborative learning all become a trend at some point in time. As products of technology innovations, we have seen the wave of audiovisual instructional materials and instructional films, a rush for integrating computers in the classroom practices, a high number of educational games, and a hype for Massive Open Online Courses (MOOC) at another time. As new agents emerge, others become irrelevant generating this continuous need for self-organization of the system. Emergence is really a science of complexity (Waldrop, 1993).

EMBODIMENT

Embodiment is a relatively new concept that removes itself from the traditional dualistic discussions of cognition existing in the head of the individual versus cognition existing outside of the individual. Simply put, embodiment is the idea that "knowledge depends on being in a world that is inseparable from our bodies, our language, and our social history . . . " (Varela, Thompson & Rosch, 1993, p. 149). Critics of embodied cognition explain that this theory has a number of other claims (Wilson, 2002). Thus, for the purpose of this study, I will use the concept of embodied cognition articulated by Varela, Thompson and Rosch (1993). Trying to solve for the challenge of combining different sciences (neurobiology, linguistics and social psychology) to understand embodiment, the authors proposed two key points. The first one of embodied cognition conditioned by the different sensorimotor abilities of the physical body. As a result, individuals embody experience through their senses. The second that "the individual sensorimotor capacities are themselves embedded in a more encompassing biological, psychological and cultural context" (Varela, Thompson & Rosch, 1993, p. 173). In this case, the theory of embodied cognition perceives our knowledge as dependent on the experiences of our physical bodies with the world in which we are immersed. That is, we simply cannot separate our body from our environments.

It is worth mentioning that embodied cognition does not exclude other concepts relevant to complex systems discussed above. In fact, this theory emphasizes or complements some of those concepts. For instance, embodied cognition recognizes that cognition is situated. The theory of embodied cognition also applies the concepts of

affordances and constraints of the environment. Finally, it focuses on the relationships of body, environment and mind, following the idea that complexity lies in the relationships, not in the elements or agents of the system alone. More specifically, Varela, Thompson and Rosch (1993) used the term *embodied action*, and explained:

> By using the term *action* we mean to emphasize once again that sensor and motor processes, perception and action, are fundamentally inseparable in lived cognition. Indeed, the two are not merely contingently linked in individuals; they have also evolved together (p. 173).

In applying the concepts of embodied cognition presented by Varela, Thompson and Rosch (1993) to an ecology of instructional design, we consider that instructional designers, the products they design, and the learners all have physical bodies. Further, following the second argument, we understand that those physical bodies and their sensorimotor capacities (if applicable) are situated in biological, psychological and cultural contexts. Finally, we understand that the relationships of those physical bodies with each other and with the environment contribute to the complexity of an instructional design ecology.

The instructional design process is embedded in physical experiences. The instructional designer may walk to meeting rooms, read project documentations, type on the computer keyboard, write on paper, or draw ideas and concepts on a whiteboard. The object being designed is embodied in instructional design documents, flowcharts, prototypes and other artifacts. Each of those artifacts has a certain format or shape that can be identified by the other members of the team and the project stakeholders. In addition,

the sensorimotor abilities of the learners will inform the design and the designed object. Thus, if there is a blind learner among the group of learners, the instructional designer will have to make the appropriate adjustments to accommodate the needs of all learners.

Having a physical body and embodied experiences are not enough to make embodiment relevant to the study of an instructional design ecology, however. Without a defined framework to guide studies of embodiment in a complex system, we must consider only what accounts for complexity. That is, embodiment is relevant to the study of complex systems only if the relationships it produces are dynamic and contribute to the autopoietic organization of the system (Maturana & Varela, 1980). So, the question that will guide our observation of embodiment in an ecology of instructional design is: how do the relationships generated from embodied actions of instructional designer, learners and designed object constitute emergence?

ENACTION

Traditional theories in cognitive science and cognitive psychology have always worked with the concept of mental representation—a hypothetical internal cognitive representation of the external realities. Through enaction, Varela, Thompson and Rosch (1993) introduced a revolutionary principle that ignores the concept of mental representation.

> If we are forced to admit that cognition cannot be properly understood without common sense, and that common sense is none other than our bodily and social history, then the inevitable conclusion is that knower and known, mind and world,

> stand in relation to each other through mutual specification or dependent coorigination (p. 150).

The enactive approach considers the individuals' perceptions and embodied actions to interpret the world in specific situations. In this new approach, body and mind are interconnected, defining each other and co-constructing the world through perception and action. They added:

> [E]nactive approach is the study of how the perceiver can guide his actions in his local situation. Since these local situations constantly change as a result of the perceiver's activity, the reference point for understanding perception is no longer a pregiven, perceiver-independent world [reference to mental representations] but rather the sensorimotor structure of the perceiver . . . . This structure—the manner in which the perceiver is embodied—rather than some pregiven world determines how the perceiver can act and be modulated by environmental events. Thus the overall concern of an enactive approach to perception is . . . to determine the common principles or lawful linkages between sensory and motor systems that explain how action can be perceptually guided in a perceiver-dependent world (p. 173).

From the passage above, we understand that enaction is defined as a dynamic activity of situated sense making through co-evolving perception and action, and as the individual makes sense of the situation, the situation shapes the individual.

As we can see, the enactive approach depicts the complexity of the system. It accounts for the fact that the system is dynamic, nonlinear and self-organizing, that the

interconnections are situated and that the relationships with the environment allow for the agents to continue adapting. Thus, the enactive approach accounts for several layers of complexity.

The enactive approach offers a robust framework for studying an ecology of instructional design. It shows that the practices of the instructional designer as well as the activities of the learners condition the environment while being shaped by it. We can also see enaction come about as the instructional designer tries to understand the problem at hand through embodied actions of talking to the stakeholders and the SMEs, reading project documentations, taking notes and sketching and outline for the design object. The enactive approach indicates that the instructional design problem is not well defined at the beginning of the design process. Instead, it is interpreted and shaped over time as the instructional designer starts seeing the design object take shape on her computer screen. This paradigm is very different from the traditional theories of instructional design that assert that the instructional design process starts with a well-defined problem and offer rigorous procedures for the design steps.

The four attributes of complex systems discussed above—distribution, embodiment, emergence and enaction—are not the only concepts possible for guiding a study of an instructional design ecology. They are, however, concepts well established in the cross-disciplinary literature of theories of complexity and they encompass fundamental properties of complex systems such as dynamic, spontaneous, nonlinear and unpredictable. Holland (2006) offers a list of properties that can be used to guide research on complex systems.

Next, I will discuss how the attributes I chose to describe here reveal themselves in ecologies of instructional design.

DIMENSIONS OF COMPLEX SYSTEMS

Syverson (1999) proposed five dimensions of complex systems in which we can observe the attributes of distribution, emergence, embodiment and enaction manifest themselves.

Physical-material (including technology)

We say that an object has material properties when it is tangible. Not all objects created by an instructional designer can take a physical form. We can print the text of a digital document created in a word processor, but we cannot have a physical form of an instructional video or a computer simulation. Therefore, we cannot say that all digital objects have material properties *sensu stricto*. Still, digital objects created by instructional designers emerge through the designer's and the learners' physical interactions with material objects: video cameras, computers, mobile devices, pen, paper. Also, we consider that instructional designers and learners have a physical body: they might need to stretch on their chair after several hours of working or studying, their eyes may get tired from looking at the computer screen for too long, their back may hurt if they do not have good posture after long hours of designing or taking a course, their wrist may hurt from typing, a room may be too cold, or a light may be too bright. Instructional designers interact with many objects and technologies for designing or managing the design process. And so do

learners while they are interacting with the design object. All of these are examples of the physical dimension in which we can observe the complex system emerge.

Social (inter-individual)

The predominant literature in instructional design focuses on the social aspects of learning rather than on the social aspects of designing. When the focus is on instructional design practices, the topics of investigation are mostly related to models, how-to techniques and strategies, technologies for teaching and learning, and learning theories for the design of learning environments. In fact, looking through the tables of content of major instructional design books, one can observe how conceptual or task-oriented the topics are. In general, experts recognize that instructional designers interact with other instructional designers, clients, SMEs, instructional media specialists or a production team. Cennamo and Kalk (2005) dedicated one chapter of their book to issues of collaboration and communications in a very pragmatic manner—a great resource for new instructional designers. Yet, the list of topics we usually see gives the impression that the instructional designer professional is a "lone-wolf", working in isolation and owning all that knowledge and process by herself. For the purpose of this study, the social dimension of an instructional design ecology will include the interactions between individuals and teams, social structures of the project team and organization, practices and relationships.

Psychological (intra-individual)

Despite the fact that instructional design originated in the field of educational psychology, there is not a large body of research dedicated to the psychological aspects of

designing instruction. Similar to the social dimension, the psychological aspects of instructional design are applied to the understanding of learning events and experiences—in the classroom, with technology, with peers. On instructional design practices, a few studies in more recent years have regarded instructional design as problem-solving (e.g. Jonassen, 2008) or decision-making (e.g. Christensen & Osguthorpe, 2004). Many of those studies report on instructional design and learning theories as tools for problem-solving and decision-making rather than considering thoughts and emotions of instruction designing. In a pioneering study, Williams (2016) investigated how instructional designers perceive empathy, and how empathy was displayed in their daily work practices. He found a lack of literature that explored empathy in instructional design. There are many psychological aspects of instructional design practices that have not been explored yet. Some instructional designers panic when they do not have all the information they need to work on their deadline. How do instructional designers deal with issues of power in the project team? How do instructional designers resolve conflict? Instructional designers also experience something similar to writer's block—how do they get out of it? How does instructional designer's perception of the project team members affect the design? These are just a few examples of topics related to thoughts and emotions in instructional design. What other psychological aspects of instructional design practices can inform the field? Observing an ecology of instructional design may allow us to discover more relevant issues.

Spatial

Varela, Rosch and Thompson (1993) spoke of the "space of chess" to exemplify well-defined task domains. Instructional design also has some spatial properties although they may not be as obvious. The content and organization of an SGT, for example, may be conditioned by the space of learning content management system (LCMS) templates. Texts, images and videos take up space on a screen. Multimedia objects also increase the file size of instructional design deliverables such as educational games and simulations. Is designing for 15-inch computer screens the same as designing for smartphones? Is designing for face-to-face spaces the same as designing for virtual ones? Learning products generated through instructional design efforts also cross open spaces like computer networks. Instructional designers as well as the learners are situated in spaces such as an office, a classroom, a cubicle, a meeting room, a home office, an airplane. A digital space such as an educational game, can take the learner to a new 3D world. Computer simulations allow flight students to experience the cockpit without them having to get on an airplane. A video can take learners to places where they may have never been or may never be able to go. Also, designed objects " . . . real estate usually entails a cost . . . " (Syverson, 1999, p. 20). The production cost of an SGT containing only text and images is different from the production cost of an SGT that contains videos. There may also be distribution costs, and access costs for the learners. Finally, there is a *temporal* cost in designing, and developing learning products. And usually the more real estate it requires, the higher the temporal cost. These are just some examples of the spatial dimensions of the relationship between instructional designers, learners and the object designed.

Temporal

As suggested above, the temporal dimension of instructional design can be observed in the time that it takes to produce some elaborate or media-rich courses and training pieces. And it can also be much more complex. After observing cognition in a natural setting, Hutchins (1995) concluded that at any moment in any culturally situated activity, there are three different historical trajectories happening at the same time—conduct of activity, development of practitioners, and development of practices (p. 372). Let us apply these concepts to an ecology of instructional design. Consider the following scenario: an instructional designer designing a media-rich SGT to be distributed through an LMS. The conduct of activity represents the environment and technologies that afford the realization of the instructional design. The historical trajectory of the technologies used for teaching and learning go all the way from instructional films to mobile devices-enabled practices. Notice that I am considering only the technologies from the time when instructional design started to develop into a discipline of inquiry. The instructional designer in this present scenario may have experience with few or many technologies available in her design environment. All other functional technologies utilized to aid this design activity are also considered: computers, emails, and concept maps software to name a few. All the technologies available in this environment have a temporal significance in the present activity and in the history of technologies. The environment in which this activity is embedded is also coevolving over time with the technologies available in the industry. Maybe the organization does not have a large budget and can only offer "outdated" technologies. Or maybe the organization has a healthy budget to offer the latest

technologies for instructional design and for learning. If the instructional designer is required to use a particular technology that she has not used before, she will have to learn "on the fly." So her experience (historical relationship with the technologies) is also accounted for. This concept intersects with the development of the practitioner, which corresponds to the development of the instructional designer. It takes years to be formally and rigorously trained to become an instructional designer (academic experience), and more years to accumulate knowledge through real-world practices (professional experiences). Finally, the development of the practice indicates the history of the practice of instructional design. Although instructional design is considered a young discipline, it evolves fast as new learning theories emerge from new technologies and the actual design practices continue to emerge from both.

> The five dimensions outlined . . . are five aspects of every object, process, fact, idea, concept, activity, structure, event and so on. Thus, although we can distinguish these dimensions, they cannot be 'separated out,' because they are interdependently specified. As in geometry, single dimension objects can only exist theoretically, in the imagination (Syverson, 1999, p. 22).

Also, these five dimensions are properties of each one of the four complex systems' attributes previously discussed. Thus, each attribute presents all four properties. Finally, each property is distributed across all four attributes. Syverson (1999) illustrated this concept in Figure 1 below.

Figure 1: An Ecological Matrix

An Ecological Matrix

	Physical	Social	Psychological	Spatial	Temporal
Distribution					
Embodiment					
Emergence					
Enaction					

Note. From The *Wealth of Reality: An Ecology of Composition* (p. 23), by M. Syverson, 1999, Carbondale, IL: Southern Illinois University.

Although each individual concept of the ecological matrix was illustrated by an example in instructional design, I will present a scenario in which we can apply the ecological matrix to an ecology of instructional design.

Instructional Design Ecology Scenario

- Setting: An instructional design organization within a technology retailer.
- The context: New technology products were added to the stores inventory.
- The project: The corporate leaders in charge of the stores requested new product training.
- Target audience: Technology retailer employees.

- Learning objectives: To explain the features and benefits of the products, and to demo the products upon customers' requests.
- Delivery: Self-guided training (SGT).
- Learners' context: Training to be taken on smartphones.

After a needs assessment, the instructional designer's initial idea was to have the learners explore the manufacturers' website so they could learn details about the products' features and benefits before a hands-on activity. Because the training would be taken on a smartphone, he decided to create a series of five short courses—10 minutes each. As the instructional designer began to plan the design of the training, the stakeholders informed him that the learners would be taking the course on a mobile device that did not have open access to the Internet. The instructional designer partnered with the technology team to arrange for specific Internet access permissions.

Although not rich in details, the scenario above is an example of how the relationship between the instructional designer and the learners influenced a designer's decisions. In this case, this relationship led the designer to reach out to the team that had the knowledge of technology to support the initial design plan. This is an example of distribution of knowledge. Without the technology team, the instructional designer would have to reconsider his initial plan of having the learners access the product manufacturers' websites. In addition, without the stakeholders' knowledge, the instructional designer would not have known of the learners' context, and the design training would have not been successful. With the new information from the stakeholders coming into the system, the instructional designer took action, and the system got reorganized with new

partnerships and strategies. This self-organization of the system is an example of emergence. Now let us assume that the instructional designer made the decision to design a series of five short courses because of the training delivery medium, smartphones. We can infer that such decision was informed by the literature on mobile learning, and also by the designer's own sensorimotor experiences with reading on smartphones or having online learning experiences on a mobile device. That sensorimotor experience informed his design. Instead of having long courses listing the products' features and benefits, the instructional designer opted for using the manufacturers' websites as resources. Like a domino effect, this design decision created a new design environment—new connections and partnerships. The new connections and partnerships, in turn, shaped the design decisions through requests and negotiations. This is an example of enaction. This scenario also shows the five dimensions across the relationship between the instructional designer and the learners. The physical–material context of the learner influenced design decisions. It also triggered social relationships—the new connections the instructional designer built with the technology team. If the instructional designer did not have a good perception of the technology team, would he have reached out to them? When he found out that the learners did not have open access to the Internet, how did the instructional designer react? How did his reaction influence his following decisions? How might have his psychological state of mind influenced his next moves? The size of the screen of the mobile devices might have also influenced the designer's decision—spatial dimension. And finally, the project timelines (temporal dimension) influenced the designer's decision to reach out to the technology team and negotiate access to specific websites. Also, if the designer did not

have past experiences (temporal dimension) with designing mobile learning, would have he made the same decisions to create short courses? Although brief, this scenario allows us to apply the ecological matrix and observe, albeit hastily, the complexities of an instructional design ecology. Because this was not a rich description, some of the concepts of the ecological matrix were made based on assumptions.

As explained by Syverson (1999), the ecological matrix is a representation of how some attributes and dimensions of an ecology intersect. It is not to be used in a linear way because one of the properties of a complex system is non-linearity and those concepts overlap. Also, it is not to be used to delimit the dynamics of an ecology. Still, in order for the readers to have a better grasp of how the instructional design ecology in this study will be observed, I will attempt to put the scenario above within the ecological matrix for illustration purpose only. This is illustrated in Table 1 on the following page.

Table 1: Example of an Instructional Design Process Within the Ecological Matrix

	Physical	Social	Psychological	Spatial	Temporal
Distribution	Smartphone as delivery medium without open access to the Internet. Knowledge distributed among stakeholders, instructional designer and technology team.	Stakeholders and technology team.	Perception of technology team.	Series of five short courses.	Deadlines negotiated between instructional designer and technology team.
Embodiment	Sensorimotor experiences with mobile learning.	Sensorimotor experiences informing the need for partnerships.	Sensorimotor experiences with smartphones and state of mind that led to the decisions of reaching out to other teams.	Sensorimotor experiences with mobile learning and the decisions to have short courses.	Previous experiences with mobile learning on smartphones.
Emergence	New information about the delivery medium.	New partnerships	New partnerships may reshape the designer's state of mind and decisions.	Smartphones have small screens. Designer considered that.	Were new deadlines negotiated allowing the system to self-organize?

Table 1 (continued): Example of an Instructional Design Process Within the Ecological Matrix

	Physical	Social	Psychological	Spatial	Temporal
Enaction	The delivery medium informed the designer's decisions and the designer's decisions shaped evoked changes in the delivery medium, both impacting the design environment.	How the new partnership might have impacted the designer's perceptions of the environment, and how the perceptions of the environment impacted the new partnership.	How the designer's state of mind impacted the environment and how the environment impacted the designer's state of mind.	The learning environment impacted the design environment and the design environment impacted the learning environment.	Deadlines impacting the decisions transform the design environment and the design environment may require new deadlines.

Note. The table above was created for illustrative purposes only and will not be repeated in this study.

CHAPTER 3: RESEARCH METHODOLOGY

As noted above, traditional literature explains instructional design as a well-structured, mechanical and logical process that requires deductive reasoning to be performed successfully. Criticism of that point of view has been justified by claims that the practice of instructional design in the real world is a lot more flexible, less predictive, and less procedural than the theories present. Corroborating those claims, Gibbons (2014) stated,

> There is nowhere written in tablets of stone a formula defining the proper organization of work and skills and knowledge within a field of design—not even instructional design, which has fallen into some very inflexible and hard-to-change patterns (p. 73).

Advocates of context-based instructional design have recommended we conduct research on instructional design in natural settings to gather evidence of real-world instructional design practices. They suggest that we use less self-report, interviews and surveys as methods of data collection, and start observing and describing the practice of instructional design for what it really is.

Although I have read some research studies in which the context of instructional design is considered relevant to the design process, we still do not have an understanding of instructional design as an ecology of interconnected elements and processes that are physically, socially, psychologically, temporally and spatially emerging, dynamically, in simultaneous and codependent activities.

Based on the reports I reviewed, it seems that instructional design researchers, even those who criticize the traditional literature, are still influenced by common assumptions about a systematic design of instruction. The first assumption is that to understand a system, the system has to be broken down into parts. The second assumption is that each part of the system can be analyzed independently. The third assumption is that the system happens in a vacuum, without a coevolving environment. The fourth assumption is that the instructional designer is the sole proprietary of the design process, and therefore design decisions are not negotiated or co-constructed with the other elements of the system. Instead, design decisions are depended on the instructional designer's knowledge of instructional design models and learning theories. Finally, as a result, instructional design is investigated in fragmented ways through studies of models of design (e.g. Dick & Carey, Backward Design), separately from uses of technologies for teaching and learning (e.g. blogs, educational games), independently from strategies for teaching and learning (e.g. accelerated learning, problem-based learning).

The Research Question

The goal of this study was to describe the dynamics of an ecology of instructional design by observing how distribution, emergence, embodiment, and enactment happen across the physical, social, psychological, temporal and spatial dimensions of the ecology. This means that this study proposes a perspective that differs from traditional concepts of instructional design found in the literature today. First, it understands instructional design as a situated cognitive process, deeply embedded in its social contexts. Thus, it investigated

an instance of instructional design practices in the real world not by analyzing the individual elements of an instructional design ecology, but by synthesizing the relationships between those elements. I acknowledge that this was challenging and, to the best of my knowledge, it has not been done before in the field of instructional design and technology.

Therefore, I set out to answer the following question:

- How do instructional designers design from project intake to designed product?

To answer that question, I observed an instructional designer in a learning and development (L&D) organization within a large multinational corporation and I attempted to describe:

- The contexts of the instructional designer, the target audience and the product being designed.
- How the design process was distributed or coordinated across the instructional design ecology.
- How the instructional designer adapted the process and/or the product being designed to the needs, expectations and demands of the design context
- How the embodied aspects of the instructional designer, the target audience and the product being designed informed the design process.
- How the instructional design process was enacted—observable types of situated practices or activities in which the instructional designer or learners engage to inform the design process.

The Research Methodology

To answer the research question, I conducted a qualitative case study. According to Yin (2009), ". . . you would use the case study method because you wanted to understand a real-life phenomenon in depth, but such understanding encompassed important contextual conditions—because they are highly pertinent to your phenomenon of study" (p. 18). That is, case study is appropriate when researchers want to take an in-depth look into a complex phenomenon situated in its natural environment, and it is difficult to define the boundaries between the case and its environment. The case study is preferred when the researcher cannot control the events or behaviors observed, and it is also appropriate for "how" and "why research questions. Case study is not used to compare phenomena, but to understand, explore, explain and describe a case as it is. Therefore, I used a single case study method while applying complexity theories as a framework to observe and describe instructional design as it happened in the workplace. At this point, the discipline of instructional design does not have rich descriptions of what instructional designers do *in situ*, and a body of research that describes instructional design ecologies has not yet been developed. Consequently, this case study is descriptive in nature, and it will not attempt to go beyond description toward explanation of complex instructional design situations.

Case study was the appropriate design for this study as it sought to investigate instructional design in a comprehensive way, as an ecology, including the complexity of the relationships among its many elements. There are many concepts that need to be kept in mind when studying systems—adaptation, complexity, non-linearity, unpredictability, agents, diversity, aggregation, distribution, information flow, emergence, embodiment,

enaction, hierarchies, roles, relationships, socio-cultural-historical contexts and practices are just some of them. As Yin (2009) put it, "[t]he case study inquiry copes with the technically distinctive situation in which there will be many more variables of interest than data points . . . " (p. 18). One very important principle to keep in mind is that in a complex system, the whole is greater than the sum of its parts. When using complexity theories, researchers are not trying to dictate how a system should behave, but to observe, describe and synthesize its interdependencies and interrelationships to explain how it sustains its coherence and identity. Naturally, the investigation will yield "a thick description of the case" (Merriam, 2009, p. 43). Therefore, through rich descriptions, this case study narrates the phenomenon of instructional design as it was—the events were not manipulated, and it was impossible to predict the variables for they were deeply embedded in the situation.

Another reason for why the case study method was suitable for this research was because this study is closely aligned with Syverson's (1999) study. Syverson utilized the ecology matrix introduced above in three case studies to investigate the complex relationships among writers, readers and texts in ecologies of composition. I have used the same ecology matrix to investigate the complex relationships among instructional designer, learner and product designed in an ecology of instructional design. This rationale is corroborated by Yin (2009) in "[t]he case study inquiry benefits from the prior development of theoretical propositions to guide data collection and analysis" (p. 18). Syverson's (1999) ecological matrix and study was the tool that guided the data collection and analysis of the present research.

Finally, through case study, a researcher can confirm assumptions, strengthen theories, or even propose new ways of looking to a problem as unexpected observations can emerge from a case study research. Hence, this case study may reveal possible unknowns of instructional design practices in their natural environment and support a new perspective of instructional design as an ecology "in which human cognition interacts with an environment rich in organizing resources" (Hutchins, 1995, p. xiv).

THE CASE

"A case study is an in-depth description . . . of a bounded system" (Merriam, 2009, p. 40). What makes case study different is that its unit of analysis defines it. A case can be an individual, a group of people, an event, a program, or even processes. However, it has to be a unit situated in real-life contexts. The case, not the topic, is what defines a case study. Yin (2009) suggested that time or space could be used to set boundaries for the case. Merriam (2009) indicated that delimiting the data collection by time or by data sources can ensure that the case is bounded. In this study, the unity of analysis is not a solitary instructional designer. The case here is the instructional design ecology. To set boundaries for the case, this study focused on the relationships among the main elements of the ecology—instructional designers, learners and the object being designed. Merriam (2009) also stated, "[t]he bounded system, or case, might be selected because it is an instance of some process, issue or concern" (p. 41). In this study, the instructional design ecology observed was an instance of real-world instructional design, in particular, instructional design in a learning and development (L&D) organization in a multinational corporation.

SAMPLING

Because this study investigated instructional design in its natural setting, I have proposed that instructional designer, learners and the design object be considered the main elements of the ecology. To observe an instructional design ecology, the elements of the system were not analyzed individually, but a synthesis of their relationships was necessary. Although the conditions, events and behaviors were not manipulated, and the variables were not predicted, the site and instructional designer leading the instructional design efforts met the following requirements:

1. The site was a learning and development organization with one of its functions being instructional design rather than an instructional design-consulting firm composed of a single instructional designer.
2. The instructional designer leading the effort had to have formal education in instructional design, and at least 1 year of professional instructional design experience.

Those requirements were identified as settings and participants that would have the greatest potential to represent a typical instructional design environment, and authentic instructional design practices. Those requirements were also established to avoid questions regarding the legitimacy of the professional instructional design practices observed. As Merrill (in Reiser & Dempsey, 2007) stated, "[i]nstructional products can be, and often are, designed without sufficient considerations of the applicable verified instructional designed theory. Such an approach is not a technology of instructional design but the art of instructional design" (p. 6). Thus, establishing those conditions were met was an attempt

to ensure that the practices observed in this study are what experts and scholars know as instructional design.

The Research Context

THE ORGANIZATION

The site of this study is a learning and development (L&D) organization within a multinational corporation. The organization, to which I will refer as L&D, has several teams with a staff of approximately 100 people, and provide learning and development support to all retail employees in physical stores and call centers worldwide. This particular organization was selected as my research setting for four main reasons:

1. the size of the instructional design team and the diversity of its clientele
2. the size and diversity of the potential target audience
3. the potential diversity of the instructional design projects
4. convenience—my easy access to design projects within the organization

I believed that items 1 to 3 in the list above would most likely impact complexity in an instructional design project and offer greater contribution to an information-rich case (Patton, 1990).

It is important to understand the context under which this research was conducted because the L&D organization was undergoing major reorganization, including the instructional design team. At the outset of this study, the instructional design team within L&D had about 11 instructional designers, some of them contractors, who were supervised by two instructional design leaders. Although it had two leaders, they worked and

functioned as one big team. Together with the instructional media team, the instructional design team reported to one manager, and designed learning products and environments to a target audience of approximately 70,000 retail employees globally. The typical instructional design projects come to L&D as requests from retail directors and leaders who sit in corporate offices. The projects and requests usually originate from changes in internal policies, procedures, and systems, launch of programs to support retail employees, and in the products and services the company sells. Typically, the projects require a meeting between the corporate retail directors and senior leaders of the L&D organization. Then, L&D senior leaders engage the design team manager who in turn, engages the design team leaders. Often, instructional designers are not invited to those initial meetings as they tend to relate to business negotiations around the project request. Those meetings culminate with an intake form, which identifies the project requestor, the target audience, and the due date. The form also includes a brief project description, and other project information such as identified skill gaps and success measures. The instructional design team manager and instructional design team leaders, then, revise the intake form, and identify an instructional designer as the design lead of the project. Depending on the project scope, one or two or more instructional designers may be assigned to the project. Even if a project has multiple instructional designers assigned to it, only one instructional designer is identified as the design lead. During a project, the instructional designers work with a project manager and media specialist(s) from the L&D organization on the design effort, and once the course or courses is/are ready, they are sent to be proofread by L&D editors, and finally translated by the L&D translation partners. The project is also assigned a systems developer who gets

the courses uploaded onto the system and launched in the learning platform to the required target audience. Also, during the design process, there are regular project team meetings with SMEs and stakeholders from corporate retail.

On a typical day, the instructional designer arrives at the office, and checks her emails and calendar before addressing the items on her to-do list. Because the team serves a global audience, meetings can start as early as 8:00 a.m., and go as late as 10:00 p.m. Central Time. One instructional designer may work on multiple projects at the same time. Project meetings include kickoff meetings, progress updates, instructional media requests and reviews, discussions on success measures and evaluation strategies, scheduling of resources such as editors and translation services, and content reviews to name a few. Meetings happen mostly via a web conferencing tool and face-to-face. Other monthly meetings include whole team meetings, and design team manager-instructional designer updates. With the number of meetings per week, many instructional designers understand that not enough time is left for design and development. Some have come up with strategies to solve this problem—blocking their calendars so that no low-priority meetings are scheduled, and working in their work offices with closed doors or from home in order to avoid distractions. The instructional designers in the team are also asked that every week they report a forecast of their commitments as far as they can predict their hours. Although projects can change drastically in scope, the forecasts allow the instructional design team manager and team leaders to make decisions about to whom assign new projects. Years of experience and performance are also accounted for when selecting an instructional designer to lead the design of a project.

THE PARTICIPANT

Among the 11 members of the instructional design team, only three instructional designers had verified formal education in instructional design or curriculum development. One was myself, and I chose not to do a study of my own experiences. That left me with two options. Purposeful sampling was the strategy utilized to select the instructional designer-participant (Merriam, 2009, p. 79). Purposeful sampling indicates that the participants selected are recognized for their expertise and competence (Chein, 1981 as cited in Merriam, 2009, p. 77). Thus, the instructional designer selected as the participant in this study has a master's degree in instructional technology from a large research university in the Southwestern United States, and about 10 years of professional instructional design experience at the time the data were collected. Also, I had worked with her on several different projects, and had witnessed her knowledge and experience in practice.

Although the instructional designer participant had been with the company for only three years, she was recognized as an experienced instructional designer by her colleagues, team leaders and design manager. She was often assigned to mid to large scale design projects that required more problem solving in terms of instructional design as well as more negotiations with the stakeholders. She had good relationships with her teammates and other L&D staff, and was known for being flexible, reasonable and understanding even when the projects were considered difficult.

When I approached the instructional designer to request her participation in this study, she was very receptive to the idea. I explained the study goal, and set expectations

regarding what I would need—to attend project meetings with her, be copied in the project emails, have access to iterations of her design documents up to the final designed product, and conduct two interviews, one before she started on the project, and one after she completed the final deliverable. I explained to her that there would be no judgement of her work because my focus was on the instructional design process itself as it happened in a real-world situation. Besides signing a consent form, the participant also agreed to tell the project team that I was just shadowing her. That was our way to ensure confidentiality.

After getting the participant's consent, I requested a meeting with the L&D organization's higher-ranking staff, L&D's director. Once more, I explained the goal of my study and assured her that no identifiable information would be revealed. After the meeting, I submitted the consent forms to the director so she could have a formal document in which it was stated that both the company's and the participant's identities would be protected as per the Institutional Review Board's regulations, and I would have the final approval to conduct my research. Finally, after all the signed consent forms, the participant and I waited, but not too long, to have her assigned to an instructional design project so that I could observe the design process. Because we had no control over such decision, neither the participant nor I knew what type of project she was going to get.

DATA SOURCES

This study used qualitative data collection methods to gather evidence of the relationships among the elements of the instructional design ecology and its environment. The data sources for this study included two semi-structured interviews with the instructional designer, field observations, email communications, and artifacts related to

the instructional design process, including documents created by project managers that were shared with the instructional designer participant. The use of multiple data sources allowed for triangulation of the collected data to increase the credibility of the findings.

Because this study was conducted in a natural setting, I had no control over the setting and the events that occurred. Therefore, there were no guarantees that I would be able to observe an instructional design project from beginning to end. The data collection timeline, therefore, depended on the natural project life and events.

The first interview was conducted after the instructional designer had been assigned to the project to be observed, but before the project kickoff meeting. The second interview happened after the instructional designer had handed over her final deliverable and had no more involvement with the project to ensure that the instructional design process had been in fact completed. The interview questions were purposefully designed to collect information regarding the instructional design process (see appendix A for interview questions designed for this this study). The questions for the first interview focused on instructional design practices in general, and the last interview questions focused specifically on the instructional design practices in the project observed in this study. In the last interview, I also asked the instructional designer how her participation in a research study might have affected her understanding of her role as a designer and possibly the design. That was an important question because the interview questions could have triggered an action of reflective practice, especially reflection on action (Schön, 1983).

Field observations included meetings and impromptu work sessions. Because I only attended scheduled project meetings, informal project conversations between the

instructional designer and other project team members were missed. The field notes included description of the physical work environment, including the technologies utilized by the instructional designer and the purpose they served at the moment of use. When observing a project meeting, the purpose of the meeting (e.g. what problems were being solved), the number of participants and their role within the project, and the types of interactions that occur were also noted (Merriam, 2009, p. 121). See appendix B for an example of the template that I utilized for field observation. As a participant observer, I had the advantage of being immersed in the research setting, at least to a certain extent. "Immersion in the setting permits the researcher to hear, to see, and to begin to experience reality as the participants do" (Marshall & Rossman, 2006, p. 100). That helped avoid problems of being considered an outsider or having my presence disrupting meetings flow.

Artifacts were also utilized for being another common data source in case studies. The artifacts collected in this study included outlines, drafts and last available versions of a content analysis map, the design plan, the design product, and supporting documents such as spreadsheets created by project managers to input information related to the instructional design process. Although collected and analyzed, the final designed product (and its initial versions) will not be provided as a sample due to confidentiality requirements. Project emails were also collected when available. Because my need for data collection was not forced upon the participant, I was unable to acquire all the design documentation and all the emails exchanged between the instructional designer and the project team. Still, I was able to collect more than enough data to illustrate the instructional design process here observed.

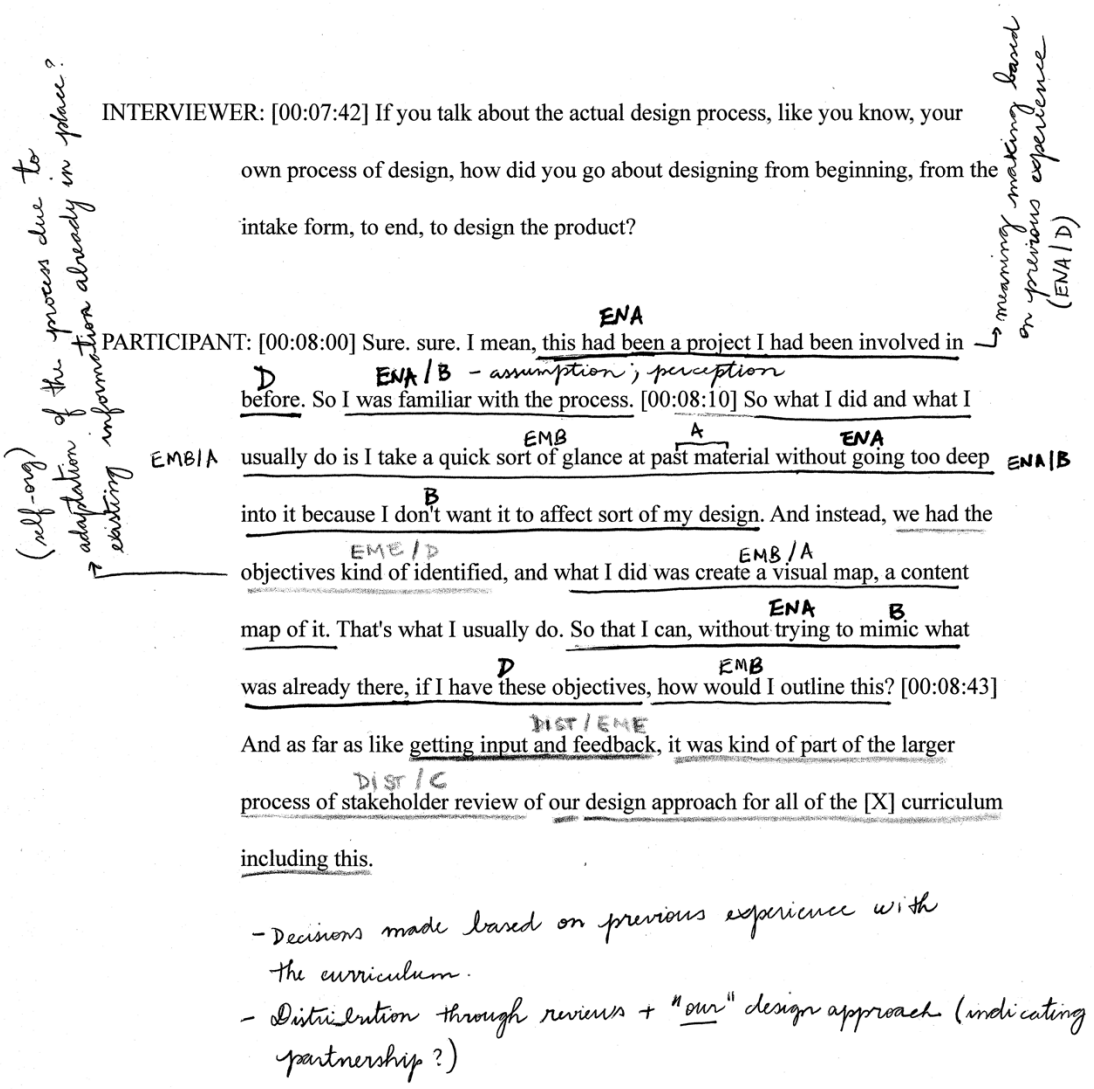
Throughout the data collection period, I was able to gather data from two interviews, 12 meeting notes (including two voice recorded meetings), 43 email communications, and five artifacts related to the instructional design process. Three of those five artifacts were created by the instructional designer—content analysis map, design plan and the product being designed—who produced several iterations of each. The other two artifacts were created by the project manager for the instructional designer to track timelines and enter information about design and development progress.

DATA ANALYSIS

The interviews were voice recorded and transcribed within a week of the data collection. I used NVivo automatic transcription service and revised the transcription myself to ensure accuracy. Although the interview questions focused on collecting information on the participant's own instructional design practices, the analysis of this data point aligned with the concepts of distribution, emergence, embodiment and enaction, which served as the framework for observations of the attributes of an ecology of instructional design. Therefore, the framework of complexity was utilized for interview data analysis.

After the answers to the interview questions were transcribed, I hand-coded them as DIST (for distribution), EME (for emergence), EMB (for embodiment) and ENA (for enaction). In addition, I used letters A through E to identify the five dimensions of an ecology—physical or material (A), psychological (B), social (C), temporal (D), and spatial (E). Therefore, sections of an interview answer were highlighted and coded as ENA/C to indicate that enaction had been observed through the social dimension.

Figure 2: Hand-Code Sample



Similar to the interview answers, complex systems was the framework utilized for data analysis of field notes. For instance, when I attended a meeting, I recorded detailed real-time descriptions of the meeting transactions and dynamics. Subsequently, I used the field notes guide to reorganize the observation notes within the complex systems framework. Having the field notes guide aligned with the attributes of distribution, emergence, embodiment and enaction was helpful and made the analysis process faster.

Finally, the analysis of the artifacts and email communications used the same approach mentioned above, and served to triangulate the analysis of the interview data as well as the field notes. For example, the meeting notes allowed me to identify the factors that informed the participant's decision making. And through the iterations of the design documents, I could actually see how those factors impacted instructional design over time. With the meeting notes and artifacts alone, I was able to observe the what, why, when and how of the instructional design process. And the interview answers helped corroborate and strengthen those findings. Email communications also supported what I had observed in meetings, clarified some changes I had observed in artifacts, and also contained some information related to the progress of the instructional design process. Even though email communications were not the main focus of this research, they were helpful in the process of triangulation.

POSITIONALITY

Fleck (1979) demonstrated that the experiments that a scientist makes are based on his/her experiences, and that those experiences are acquired through socialization. In other words, the choice a scientist makes for a particular type of experiment over another is based on the scientist's own assumptions, and those assumptions can only be understood in terms of the scientist's beliefs and knowledge, which are social matters. Even though scientists believe that scientific facts are systematic and can be understood through logical explanations, Fleck (1979) argued that there is nothing of systematic or logical in something that is developed in a social process. Through authors such as Fleck (1979) and

through my previous research experiences, I learned that it is unrealistic to set aside my own assumptions as a researcher.

As a graduate student of instructional design and a professional instructional designer, I bring with me a set of assumptions about instructional designers and the instructional design process. Many of my former and present coworkers did not and do not have formal background in instructional design. I believe that having a strong background in instructional design allows for the instructional designer to make better design decisions, which often benefits the learner. Limitations in the knowledge of instructional design can be reflected in the struggles of an instructional designer during the design process, and in the deficiencies of the designed solution. In my experience with instructional designers who do not have a formal background in the field, every time there is mentioning of best practices for the design process, they mention ADDIE as if ADDIE were one single model and the only model of instructional design. According to Dick, Carey and Carey (2005), there are different instructional design models, but analysis, design, implementation and evaluation are the major components of all models (p. 3). Less detailed variations of the Dick & Carey model are generally known as ADDIE (analysis, design, development, implementation and evaluation) models.

The same happens when they work on trying to improve the documents that support the instructional design process (e.g. design plan). All the discussions revolve around their knowledge and perception of ADDIE. In my observation, that limits their creativity. Wilson (1995) suggested that instructional design models should be used as a scaffolding strategy in design. “At the same time, [instructional designers and teachers] should be

cautioned against simplistically 'applying' a model in a proceduralized or objectivist fashion" (p. 6). Having limited knowledge of instructional design models and perceiving ADDIE as one single model, limits instructional designers ability to solve problems during the design process. "The complexities of a situation should not be reduced down to the simple maxims of a teaching [and instructional design] model" (Wilson, 1995, p. 6).

The same assumption can be applied to limited knowledge of learning theories. Learning theories inform the design for learning and learning environments. Not having foundational knowledge of learning theories that influenced and shaped the field of instructional design can negatively impact decisions on appropriate instructional or learning strategies. Understanding learning theories and their epistemologies may prevent instructional designers from falling into eclecticism for lack of knowledge. With a breadth and depth of knowledge of instructional design models, theories and design paradigms, instructional designers can select appropriate instructional strategies in spite of the design constraints they may encounter, and ground their design decisions in sound rationale. It can also prevent them from defaulting to choosing from the predominant views. Rowland exemplified how knowledge of learning theories may support deep understanding of problems for better decision making: "If these are the conditions and this is my desired outcome, then what method will work best?" (Rowland, 1992, p. 84). That is, " . . . having a rationale for design decisions based on theoretical knowledge, in conjunction with practical wisdom and accepted organizational processes, appears to offer a more complete basis for sound professional judgment" (Yachar, South, Williams, Allen & Wilson, 2009, p. 56).

These assumptions were built upon my own experience in the workplace although I was able to use the literature to validate them. It is therefore inevitable that I should bring these assumptions to bear in my research and disclose that those assumptions also informed my selection of the instructional designer I observed in practice.

TRUSTWORTHINESS

The literature in qualitative research suggests various strategies to establish trustworthiness of the study. "Internal validity deals with the question of how research findings match reality" (Merriam, 2009, p. 213). Merriam, citing other sources, listed four strategies that contribute to high validity of an ethnographic study. Although this study is not an ethnography, two of those strategies apply here: participant observation and informant interviews. In this case, the instructional designer is the informant as she is a member of the team and the instructional design community within the learning and development (L&D) organization. Other strategies suggested by Lincoln and Guba (1985) that I utilized include triangulation, which will be the strategy to ensure credibility of the findings, and member check.

For member check, this entire dissertation was sent to the participant together with a request for her to verify whether she would agree with the interpretations presented in the discussion section of this document. A week later, the participant's response was straightforward and confirmed accuracy: "Hey, Laíse! I read through the pages! Everything looks good to me! Love your detail in the research. Really takes me back to the project."

Finally, dependability or consistency "is whether the results are consistent with the data collected" (Merriam, 2009, p. 221). The concept of dependability or consistency uses

the same techniques for validity mentioned above in addition to my statement of positionality.

CHAPTER 4: RESULTS OF THE STUDY

This chapter describes the process of instructional design from project intake to designed product in an ecology of instructional design that is distributed, embodied, emergent, and enactive by narrating:

- the contexts of the instructional designer, the target audience, and the product being designed
- how the design process is distributed or coordinated across the instructional design ecology
- how the instructional designer adapts the process and/or the product being designed to the needs, expectations and demands of the design context
- how the embodied aspects of the instructional designer, the target audience and the product being designed inform the design process
- how the instructional design process is enacted—observable types of situated practices or activities in which instructional designer or learners engage to inform the design process

The Context of the Study

From August 2018 through February 2019, I observed how an experienced instructional designer went about designing a learning product from intake to final design in a learning and development (L&D) organization within a large multinational corporation. I was interested in observing how instructional designers actually design in

the real world. There is a considerable amount of theoretical and conceptual work on the instructional design process, but the literature indicates that we do not know much about the actual practice of instructional design *in situ*. Some researchers tried to solve that problem by talking directly to instructional designers through surveys and interviews about their own beliefs and self-perception (as seen in the literature review). As an instructional designer myself, I believe that the instructional design process, as explained at conceptual levels and through self-reporting strategies, do not reflect the realities of the practice of instructional design in the workplace. By looking solely at frameworks of the instructional design process and what instructional designers believe they do, we miss the opportunity to explore the complexities in which the instructional design process occurs and the challenges instructional designers might have to overcome. Therefore, in this case study, I wanted to observe an instructional designer in her professional environment, learning about the project and the learners' environment, discovering constraints and resources, collaborating with the project team, working with SMEs and stakeholders, planning, mapping and drafting the product to be designed, solving problems, making decisions, and negotiating potential solutions. And in the process, I hoped to learn about the ecology of instructional design, in which instructional designer, learners and product being designed influence one another, and how they adapt and are adapted to the affordances and constraints of the environment to maintain coherence and successful completion of the design project. For that, I observed instructional design project meetings, collected emails between the instructional designer and the project team as well as instructional design

artifacts, and interviewed the instructional designer before and after the instructional design process.

Although this study offers more than self-reporting and observes an instructional designer in her natural professional setting, I was not able to collect all email communications, be part of every formal and informal conversation the instructional designer might have had about the project, and follow the instructional designer at all times. Still, by analyzing all the data collected, I was able to map the instructional design process as close as possible to its reality, and write a rich description of that process offering a very detailed picture of one case of what instructional designers do in the workplace when we look at the ecology of instructional design.

The Context of the Instructional Design Process

THE CONTEXT OF THE ORGANIZATION

Every year, the learning and development (L&D) organization supports the company's call centers new hire initiative. This new hiring initiative happens around the same time every year as the company prepares for an increase in sales due to launch of new products, services, and programs. The call centers are located worldwide and offer a variety of job roles (e.g. sales, customer service, order support, and payment representatives). Each job position has a curriculum designed for the new hire to acquire knowledge and skills required by their job role during new hire training. Since L&D had been supporting the new hire training for many years, the curricula are well developed. Still, every year L&D's instructional designers are assigned to redesign courses within those curricula. In the

redesign effort, instructional designers partner with subject-matter experts (SMEs), call center area leaders and regional directors, and trainers to learn about products, policies and procedures, processes, tools, and sometimes, learning approach that need to be updated in the courses they will be revising.

In 2018, however, the approach to course redesign for the new hire training initiative for the retail call centers was completely different. At the end of 2017, L&D launched a new learning platform to be the single point of online learning deployment for all retail employees, both in stores and call centers. Before that, each retail organization, physical and online stores, had their own learning platform. Having to provide content for and support two different platforms required a lot of resourcing and management strategies. Thus, a group of people within the learning and development (L&D) organization partnered with the Information Technology team to envision, design, develop, and implement a single Learning Management System (LMS) to serve both retail stores and call center populations. That was a massive enterprise, which required research, usability tests, user experience design and many other skills through a period of over a year until implementation. Based on the large scope of work related to course redesign and migration, 11 instructional designers were initially assigned to the project. To make the redesign and migration efforts of all retail courses for worldwide audiences more manageable, the learning and development (L&D) organization launched the redesigned content in waves. From November of 2017 through August of 2018, L&D instructional designers redesigned most of the courses for employees in the physical stores and deployed them in the new LMS. While instructional designers were redesigning courses for the physical stores, the

design manager, instructional design team leaders, and some L&D leaders were working together to plan a strategy to support the redesign of courses for call center employees.

SHARED OWNERSHIP

Considering that call centers support the online store worldwide, and therefore, deal with global e-commerce, the design manager and other leaders of the learning and development (L&D) organization came to the conclusion that following the old practices of redesign to support the yearly call center new hire training would not be sustainable. When supporting yearly worldwide call center new hire initiative, L&D had to redesign some individualized courses for specific regions, and sometimes for specific countries, because of differences in product and service availability, country and regional policies, procedures, processes, and systems and tools utilized by the call center employees. To efficiently and successfully redesign old content to be launched in the new Learning Management System (LMS), L&D's new strategy was based on the Federated Training Organization Model (Bersin, 2008). The Federated Model approach would allow for L&D to own the parts of the curricula that would serve worldwide learners. At the same time, following the model, the lines of business within the call center organization were empowered to own the redesign of courses that discussed specific regional policies, procedures, tools, and processes. The learning and development (L&D) organization proposed the new approach to call center directors as an initiative called Shared Ownership, which meant shared ownership of course content and course (re)design effort. In the agreement, the call center leaders would work to build an infrastructure to provide L&D with SMEs, stakeholders, and trainers as partners and to identify the people within their

own organization (mostly trainers and team leaders) to serve as "designers by assignment" (Merrill, 2007). In exchange, L&D would commit to redesign worldwide courses and serve as consultants to the designers by assignment offering training on instructional design and instructional media best practices.

THE CONTEXT OF THE INSTRUCTIONAL DESIGNER

The learning and development (L&D) organization had been going through a slow restructure for over a year. With the implementation of the new learning and management system (LMS) at the end of 2017, there was a need to rethink some roles to support the new approach—hosting and launching all retail courses in and from one platform—and the design efforts with this new technology to work more efficiently and improve the results of training. The instructional designer, to whom I will refer as Anne (pseudonym chosen by the participant herself), was immersed in this environment, where everything seemed experimental, and therefore, unstable, uncertain, constantly evolving, and at times, disorganized and confusing—from decision making to supporting roles.

Existing within that context, the project started with the following vision: Anne would redesign an entire curriculum for a particular call center role, under the Shared Ownership initiative. She would work with a peer instructional designer, who would function as an unofficial curriculum manager (as the title did not exist in the organization at the onset of the project) and a project manager. All project roles were performed by staff from the learning and development (L&D) organization. In addition, Anne would have the support of her team leader, who had in-depth knowledge of the Shared Ownership initiative because she was working directly with the call center directors on the initiative agreement,

and of an instructional media specialist. Finally, call center directors would serve as stakeholders and would assign call center staff to serve as SMEs, and design partners. The design partners would most likely be senior call center representatives, who already acted as regional trainers when needed, and who would design learning products that required specific regional content.

THE CURRICULUM

The curriculum assigned to Anne for the redesign work had been one of the latest call center curricula designed by L&D from scratch. In fact, it was first envisioned, designed and launched in 2016, and Anne herself was one of the designers who contributed to course design and development back then. For full disclosure, the researcher was one of the instructional designers who also designed the first iteration of this curriculum. The difference was that back in 2016, the instructional designers owned the entire instructional design effort and designed all the courses in the curriculum. That is, they were responsible for all the regional learning products as well. Now in 2018, under the Shared Ownership initiative, the instructional designer (Anne) from the learning and development (L&D) organization would focus only on courses that presented worldwide concepts and practices, while the regional teams would own the more specific content. Still, Anne was very familiar with this entire curriculum. The list of courses within the curriculum included trainer-led materials and activities as well as courses for independent learning, called self-guided training (SGT). The curriculum covered topics that were mostly conceptual and procedural since it is for a role in which call center representatives would have minimum customer interaction if at all. This call center function falls under the online order

administration umbrella. Most of the procedural content was related to steps that must be taken in the systems they use. Such steps are taken by the call center representatives to review the online orders and ensure the payment is correct and the order can be fulfilled. For confidentiality purposes, I will refer to this curriculum as curriculum X.

THE TARGET AUDIENCE AND THE TRAINING ENVIRONMENT

As previously mentioned, this curriculum was being redesigned for the new hire training in the call center. Learners were individuals being hired to support the large number of orders due to launch of new products, services, and programs. Before training, learners sign a non-disclosure agreement to ensure company information is not revealed publicly. After training, learners' performance is evaluated through a series of assessment activities, and the training team recommends the learners who performed well to be hired as a good fit for the role. As in previous years, learners would be attending the training mostly in physical classrooms led by trainers, with time reserved for independent study. All classrooms are equipped with white boards and markers, desktop computers for the learners, a trainer computer and a projector. The desktop computers are connected to the Internet so that the learners can access materials in the learning management system and/or servers made available to the training teams. Some learners may have had experience with the role in another company, but that is not a requirement. They are usually computer savvy or feel comfortable with computers as the job requires the use of a lot of systems.

The Instructional Design Process

According to the Association for Talent Development (ATD),

> Instructional design is the creation of learning experiences and materials in a manner that results in the acquisition and application of knowledge and skills. The discipline follows a system of assessing needs, designing a process, developing materials and evaluating their effectiveness. In the context of workplace learning, Instructional Design provides a practical and systematic process for effectively designing effective curricula. (Association for Talent Development, n.d.)

The instructional design process observed in this research has both elements that are similar and dissimilar to the definition above. Through a rich description this case study will narrate what definitions of instructional design are unable to communicate—the complexities of the instructional design process in the workplace. And through the narration, I will answer the research question—how do instructional designers design from project intake to designed product?

THE KICKOFF MEETING

The project started with what the learning and development (L&D) organization called a "kickoff meeting." In the meeting, Anne, the instructional designer, was introduced to the redesign of new hire training for curriculum X, within the scope of the Shared Ownership initiative. Only the project manager (PM), the instructional design team leader negotiating Shared Ownership with call center directors and leaders, and the instructional designer were invited to attend the kickoff meeting. Anne was informed that negotiations with the company's call center directors were still being finalized. However, the Shared Ownership initiative leaders within the learning and development (L&D) organization had

a vision for this redesign effort, and the project manager (PM) and the instructional design team leader explained what would be expected from Anne based on that vision.

The initial request was a preliminary analysis of curriculum X content so they could start getting a sense of the scope of the work. The analysis would inform the distribution of the redesign work—courses addressing global content would be redesigned by Anne as a responsibility of the learning and development (L&D) organization, whereas courses focusing on regional topics would be redesigned by call center staff, who were more familiar with the specificities of their regional content, and who would be appointed as design partners by the call center leaders. Anne was also informed that she would be working with one visual designer (an instructional media specialist), who would be supporting her requests for images, video and any other media needs.

There were still many unknowns at the kickoff meeting. For instance, the project team did not have the names of curriculum X's regional subject-matter experts (SMEs), call center design partners, and stakeholders. That information would come from the call center directors and leaders at a later time. In addition, there had been no final agreement on the target audience. The original curriculum X, designed in 2016, had a specific audience with whom Anne was familiar. However, in this new iteration, call center directors and leaders were considering the possibility of having curriculum X redesigned to serve two more call center functions. The final decision would depend on Anne's analysis and recommendation, and her recommendation would be a result of her conversations with regional call center subject-matter experts (SMEs). Finally, the instructional design team leader asked Anne to keep in mind the new learning content

management system (LCMS) and learning management system (LMS). Ideally, Anne would review curriculum X's course list, categorize the courses based on global content versus regional content, and then decide which courses containing global content should be updated. The instructional design team leader expressed her desire to see courses that did not need update to be easily migrated to the new LCMS. At the same time, she asked Anne to keep in mind that there could be some incompatibility due to file format. That was another unknown that needed further exploration.

Towards the end of the meeting, the project manager (PM), presented the project timelines to Anne, and asked how she felt about those dates (see Figure 3 below). He explained that he was not familiar with the Anne's design process, but those timelines were an attempt at highlighting their workflow throughout the design. Anne seemed very excited and confident. She expressed that those were tight deadlines based on the fact that there were still many unknowns. However, she was very positive about working on curriculum X. She explained that due to her prior experience with its content, she believed it was possible for her to move quickly with a content analysis and a design plan as long as she was given access to the SMEs in a timely manner so she could do further investigation and confirm the final target audience. She explained that the other two call center functions that had been suggested as additional target audiences were unfamiliar to her. Thus, she flagged the absence of SMEs at that moment as a potential risk to those timelines. Having said that, she focused on the positives. She emphasized her previous experience with curriculum X and expressed that she really liked working with that line of business.

Figure 3: Initial Curriculum X Redesign Timelines

PROJECTED DESIGN MILESTONES

Start Date	Completion Date	Task
Aug. 20, 2018	Sept. 10, 2018	Discovery Work
Sept. 11, 2018	Sept. 25, 2018	Design Plan Creation
Sept. 23, 2018	Sept. 25, 2018	Production Timeline Created
Sept. 25, 2018	Sept. 28, 2018	Internal Review of Design Plan
Oct. 1, 2018	Oct. 1, 2018	Stakeholder Review of Design Plan
Oct. 1, 2018	Nov. 5, 2018	Content Creation
Nov. 6, 2018	Nov. 7, 2018	Internal Review of Content
Nov. 8, 2018	Nov. 12, 2018	Stakeholder Review of Content
Oct. 5, 2018	Nov. 12, 2018	Media Creation
Nov. 13, 2018	Nov. 14, 2018	Stakeholder Review of Content and Media
Nov. 15, 2018	Nov. 15, 2018	Production Handoff and Blueprint

Note. Discovery work is comparable to analysis in ADDIE models.
Production Timeline Created refers to the work the project manager will do to ensure resourcing for course editing (proofread by editors), translation services, and uploading

courses to the learning content management system (LCMS) and publishing in the learning management system (LMS).

Production Handoff and Blueprint refers to the instructional designer's task of handing the final courses over to editors for proofreading. The Blueprint is a document with detailed information about course translations needs and audiences.

The project manager (PM) also explained to Anne that the instructional media specialist (IMS) who had been assigned to the project was an intern, and her internship would end in October. He wanted to know if Anne saw that as a potential risk. Anne explained that she did not anticipate a risk with that. The IMS could help her with the initial analysis work and prepare a media plan that could be executed by another IMS during the development phase. Also, Anne requested an immediate meeting with the IMS assigned to the project.

Throughout the meeting, Anne mostly listened and took notes, asking a few clarifying questions, and only giving her opinion when asked. The instructional design team leader did most of the talking. She shared her ideas and guided Anne through her vision. She directed Anne with her knowledge of Shared Ownership, desires and expectations. Like Anne, instructional design team leader highlighted a few areas of concern, but seemed positive about how easy the redesign effort for curriculum X could be, based on her previous experience with it. She expressed that curriculum X was well designed in 2016 and, in her opinion, it was the most stable curriculum among all the curricula being redesigned under the Shared Ownership initiative. Because of that, she

believed the migration effort would be minimum. As she stated, she expected most of the work to be a “cleanup” or a “refresh” of the courses to ensure they looked good in the new learning content management system (LCMS).

The kickoff meeting was very informative. Although there were some potential risks, the project team seemed excited about the possibilities and confident that this would be a successful project and would require minimum effort.

ANALYSIS PHASE

Understanding that the coordination of the curriculum redesign effort depended on her content analysis, Anne started working on mapping curriculum X content immediately. That marked the beginning of the instructional design process analysis phase, called discovery work by the learning and development (L&D) organization. To begin, Anne looked at the current course list for curriculum X, counted 43 courses, noted questions and concerns, and met with her instructional design team leader for some initial conversation related to design. Although I was not invited to that meeting, Anne sent me an email with the meeting summary. In her meeting notes, she painted a picture of the meeting topics, described common agreements and concerns, and finally stated a decision she made on how to move forward with her content analysis as a result of that meeting (see appendix C for entire email).

Looking at the Anne’s email, I observed the first instances of how the environment was shaping her decisions. First, she mentioned a concern about how to move the courses into the new learning content management system (LCMS). Having a new LCMS made her consider a need for change in the format of the previous materials. As stated in her

email: “We talked about what was most important, getting the material into the Learning app [LCMS] as is (but in new templates).” Subsequently, we can observe that the Shared Ownership initiative impacted Anne’s approach to the distribution of course design as it offered her a new perspective into curriculum X content—“What and Why” versus “How and When.”

She also mentioned a different approach to course design related to duration of the learning experiences. Long courses were no longer acceptable. Finally, I observed the first instances of distributed cognition and its impact on Anne’s decision in regard to content analysis strategy.

> So, I decided after this meeting, instead of just saying which courses I would do and which ones that [the call center partners] would do, was that I would take a look at the content/topics/objectives and categorize them by “What and Why” and “How and When” to get us closer to seeing what elements would be in our realm and where we hand off to [the call center partners]. (Participant’s quote from email)

The following day, Anne and the instructional design team leader met again. This time, Anne had a preliminary content analysis map draft to share (see appendix D). During that meeting, as Anne consulted with her instructional designer team leader, she made changes to the document. At the end of the meeting, Anne had uploaded 13 revised versions of the document onto the server. Although many revisions were minor updates, all revisions occurred as a result of distributed cognition, especially the instructional design team leader’s knowledge of the call center’s processes and capabilities as an organization, as well as of instructional design practices. At the end of the day, the content analysis map

indicated a completely different approach when compared to the version presented at the beginning of the meeting (see appendix E for content analysis map version of end of meeting day). Initially, Anne was mapping the content with two parallel columns, What/Why and How/When. The What/Why column indicated general content, such as concepts, process overviews, and the importance of those concepts. The How/When column indicated more specific content, such as how to perform specific tasks in a system. During the meeting, the instructional design team leader directed Anne to remove the How/When column from the table and explained that that type of content should be redesigned by the call center partners. In addition, she emphasized that Anne should focus on the content she would be designing. As a result, Anne created a Deliverables column, in place of the How/When column, to indicate the deliverables associated with the What/Why column, which would be her portion of curriculum X redesign under the Shared Ownership initiative. Yet, Anne did not delete the How/When column. Instead, it was placed in another table in the same document, and in that other table Anne listed some initial recommendations associated with the How/When content, which indicated her commitment to serve as a consultant to the call center design partners as they were not professional instructional designers.

Another observation from that meeting was that Anne voiced her concern about the tight deadlines. That was a change from her response to the project timeline presented in the kickoff meeting. The design team leader, however, dismissed Anne's concern and emphasized that she should be focusing on her task, which was the redesign of global content. In addition, the instructional design team leader kept her assumption that some of

the courses would not have to be redesigned, but simply "refreshed" for the new learning content management system (LCMS) and learning management system (LMS). Despite disagreeing on the perception of the timeline, Anne and the design team leader agreed that all courses would have to be "retouched." That meant, if a course was too long, it would have to be shortened. Also, even if a course duration was not a concern, they anticipated that the course would have to be rebuilt in a different file format because of the requirements of the new learning platform.

Anne also voiced concern about the fact that the target audience had not been agreed upon yet. She worried that the two call center functions being considered by the call center directors and leaders as additional target audiences did not share core knowledge and practices with the current target audience of curriculum X. Thus, she carefully questioned the instructional design team leader's recommendation for how to approach the content analysis of curriculum X and the assumption that the redesign effort would be easy. Again, Anne's concern was disregarded.

Although Anne had a more active role in sharing her ideas in this meeting, compared to the kickoff meeting, she seemed cautious when presenting a perspective that was different from that of her instructional design team leader. The instructional design team leader was willing to listen, but she also had a lot to say. At times, it was as if Anne had to "fight" to have her voice, opinions and recommendations considered. Still, at the end of the meeting, they were both in agreement that Anne had to change her approach to the content analysis by focusing on the potential deliverables only for global content.

The complex dynamics of the instructional design process continued to be observed as Anne met the instructional media specialist (IMS) assigned to the redesign of curriculum X. Anne and the IMS met for the first time on the second week of the analysis phase. In that first meeting, Anne introduced the project context to the IMS, considering Shared Ownership—Anne's responsibility was to redesign global content only. Although that approach seemed to reduce the scope of work, Anne explained that the call center directors were considering two more call center functions as potential target audiences of curriculum X. And since Anne did not have access to the project subject-matter experts (SMEs) yet, the actual scope of her work was still to be confirmed. She also explained her course redesign vision and goals by showing a more clearly defined content analysis map (see Appendix F).

Anne was very clear about her desire to reduce wordiness in the courses she would redesign. She believed creating infographics to demonstrate process overview, for instance, would help. Another potential solution to reduce word count she presented was having more systems simulations. The IMS, however, explained to Anne that they were unsure about whether the new learning content management system (LCMS) would work with certain types of media—html-based interactive pieces built outside of the LCMS templates, for instance. Therefore, the constraints of the new LCMS were one more factor impacting instructional design considerations. When Anne, while brainstorming ideas, mentioned live system demos as another potential solution to ensure courses were not "too text heavy," as she described them, the IMS interjected, and warned Anne of another potential risk. Because of new and strict GDPR (General Data Protection Regulation) rules, call center

trainers would not be able to conduct live system demos in the classrooms. Although learners would be potential new hires and would have to sign a Non-Disclosure Agreement (NDA) before training, the company was very strict about not allowing potential employees to see live customer data even after they had signed an NDA. That new piece of information caused Anne to pause and consider how GDPR rules could more seriously affect her course redesign ideas. The new possible solution, therefore, would be to create how-to documents containing screenshots of each process step to be followed in a tool or system utilized by call center representatives to be trained with curriculum X. The screenshots would have real customer data removed and most likely replaced with dummy data. Finally, a more reliable idea for uses of existing media was related to videos. Both the instructional designer and the instructional media specialist (IMS) agreed that updating the videos could be feasible. They talked about reaching out to the instructional media team leader to consult with him as he was more familiar than the IMS, who was an intern, with the existing videos for curriculum X.

After the meeting, Anne sent two follow-up emails to the IMS. In the first email, the she attached the latest version of her content analysis map with the considerations brought up during the meeting—constraints of the Learning Content Management System (LCMS) as well as limitations due to GDPR (General Data Protection Regulation) rules (see Appendix F). Figure 4 below shows part of the content analysis map containing media considerations such as videos, animations, infographics, and systems simulations. Some of those media types are followed by question marks. Also, in row four, there is an indication

that Anne was considering reaching out to the call center manager responsible for systems and tools to have a conversation about how to improve systems training.

Figure 4: Part of column D from the content analysis map

Ideas for Redesign of [L&D] owned content
Classroom discussion and fun intro activity (use investigative skills in classroom) - **Interview/role video of existing [Call Center Representatives] on why they do what they do**. Use existing video on impact of [call center representative] (get a list of [Instructional Media Design Team Leader) - putting together a process on updating videos
Animation/Infographic/Image with tags to represent [online order] review model (facilitated experience with virtual participant guide?),
access to [tool] for participants? or overall demo? - discussion with [call center tools and systems manager] on how we can improve systems training
Short SGTs introducing step, intro [tool] (demo? short simulation/animation?) Classroom discussion on the what and why
Short SGTs introducing step, [tool] research simulation? (demo? short simulation/animation?) Classroom discussion on the what and why
Short SGTs introducing Confirm, activity around skills, use the existing video on outbound communication?
Short SGT introducing, Classroom discussion around behaviors and data points to analyze

Note. Identifiable information has been replaced with content in brackets.

SGT stands for self-guided training.

In the second email to the instructional media specialist (IMS), Anne summarized, rather briefly, what had been discussed in that first media consultation meeting.

Hey [IMS],

Just some notes from the meeting.

- Need to check with [instructional media team leader] about existing [curriculum X] video and photography when he returns. Do you want me to do that? Or would you prefer?

- I will talk to [instructional design team leader] about overall curriculum approach and simulations/access to tools/demo/etc. Need for screenshots

- Generally, we are thinking of using existing media, and doing something new infographic-wise for [Online Order} Review Model and each step, and possibly other areas of the process that could be represented visually. All TBD. :)

[Anne] (Email from Anne to the instructional media specialist briefly summarizing what they talked about during the first media consultation on September 5, 2018. Identifiable information has been replaced with content in between brackets)

Anne had another meeting with the instructional design team leader on the third week of the analysis phase. Initially, Anne presented the new content analysis map (see Appendix G), and her idea on how to adapt the map to show the redesign responsibilities of the regional call centers. Although the instructional design team leader had previously directed Anne to focus on her tasks only, she understood that she was in charge of defining which courses would be considered global and which courses would be considered regional. And the results of that work would have to be presented to the stakeholders for agreement.

The result of the content analysis indicated that there was a total of 43 courses in curriculum X. Anne stated that after a close look at the courses, she was able to identify redundancy in the content, and reduce the course list to 37. Based on the What/Why (general overview of the role, tools and processes) and How/When (when and how to implement the processes and use the tools) approach, Anne would have to redesign 22 out of those 37 courses, and offer instructional design support to the regional teams on the remaining courses. Offering instructional design support was part of the Shared Ownership initiative agreement. Acknowledging her role as a consultant and proposing to gain agreement on the shared responsibilities she would present to the regions, Anne stated that she would like to meet with the regional trainers to get buy-in. The instructional design team leader's response was very emphatic: "You can talk to trainers all you want, but you need to ask the business." That is, the approach to the distribution of work would have to be approved by the call center directors and leaders, who were the project stakeholders and, therefore, the decision makers.

The original curriculum X had been designed around the workflow of the call center role for which the learners were training. In this case study, such workflow will be referred to as The Online Order Review Model. Anne and the instructional design team leader spent several minutes considering the model. They consulted The Online Review Model procedure document online on one of the call center online portals. They noticed that without a visual representation, the steps of the model sounded very linear, but they knew it to be an iterative process. They concluded that it was essential for Anne to consult the project stakeholders to ask two simple questions that could change the entire course list

flow. Do call center representatives assigned to this job still follow The Online Order Review Model presented in the procedure document? If not, how are those specific call center representatives trained to perform their job workflow?

In regard to instructional approaches impacted by media, two new pieces of information were revealed. The instructional design team leader had been meeting with the call center directors (Shared Ownership initiative business partners), and there was mentioning that systems simulations were "inefficient." The instructional design team leader did not elaborate on that comment. Although systems simulations had already been flagged as a risk due to potential learning content management (LCMS) constraints, Anne was still considering them as a potential instructional strategy. With that new piece of information coming from the instructional design team leader, Anne seemed to accept that she would have to completely discard the idea of systems simulations even if the LCMS could work with them. There was also a question pending related to GDPR (General Data Protection Regulation), and the potential for live system demos not to be allowed. Anne explained that this issue had been raised in a previous meeting with the instructional media specialist (IMS), and that the IMS was going through all the courses in the original curriculum X to audit the images that would need to be revised or replaced according to GDPR rules. The instructional design team leader disclosed that she and other Shared Ownership initiative stakeholders from the learning and development (L&D) organization were in talks with their call center business partners about those issues related to how-to of the processes in the systems. They had requested training environments for new hire to practice using the tools most critical to their jobs, but the call center business partners

would not move forward with that, at least not in time for the new hire training. Thus, Anne and the instructional design team leader agreed that they would have to move forward with the idea of step-by-step demonstration of processes utilizing screenshots with dummy customer data where necessary.

Finally, they revisited a previous discussion about the target audience still being a pending issue. Anne emphasized that she would need the call center leaders to identify her project SMEs immediately so that she could learn more about the roles that would potentially be added as curriculum X target audience. Without the SMEs, Anne did not have the information necessary to understand the scope of her work and start planning the instructional strategies to be applied to specific courses. Such challenge highlighted the importance of the SMEs as critical agents informing the instructional design process. The instructional design team leader told Anne not to wait until SMEs were assigned to her project as the project had a tight timeline (see Figure 3 on page 85). She stated that Anne should contact the team that writes procedure documents for the call centers to verify if they had procedure documents specific to the two roles that were still under consideration as target audiences. That way, she could start becoming familiar with the two new roles and gain some clarity to move forward into the design phase, which would begin with initial work on the design plan.

Right before the meeting ended, the instructional design team leader disclosed one more piece of information that would have major impact on the distribution of work. She told Anne that she was working with the design teams manager (the manager of both the instructional design and the instructional media teams) to get some instructional design

contractors to support the learning and development (L&D) organization instructional design effort during the Shared Ownership initiative. That meant that Anne would get one contractor to support her course development work. The instructional design team leader explained that they were still in planning mode, and if they did get help, it would not be until October.

The last meeting during the official analysis phase was related to media work. The project manager (PM) informed Anne that the first instructional media specialist (IMS) assigned to the project would focus on supporting all the visual design needs of the project. At the same time, a second IMS was introduced as a media production strategist. The PM informed Anne that he had already met with the media production strategist separately to debrief him on curriculum X redesign project. The PM expressed that he wanted to ensure the current meeting time would be used for Anne to ask questions and negotiate her requests.

Although the media production strategist was a new project team member, he immediately presented valuable information to the project. He stated that due to the tight timeline and the fact that the media team was supporting multiple curricula under the Shared Ownership initiative, they would be unable to deliver new videos. However, they were committed to redesigning graphics and creating new animations if necessary.

Despite the fact that Anne and the instructional design team leader had made an agreement on how to move forward with how-to demonstrations in systems, Anne brought up the issue of customer data privacy regulations as a pending item. The PM, then, assured Anne that training environments would not be available, and she would have to move

forward with screenshots containing dummy customer data. Anne, then, expressed her concern about the timeline. She acknowledged it was time to start drafting the design plan. At the same time, she asked for some "wiggle room" for the design plan as she would be out of town to receive a company-sponsored Kirkpatrick certification. She also considered the development phase and requested for the content to be delivered to production (editors, translation services and LMS admins) in waves rather than all at once. The project manager (PM) and Anne did not get into a clear agreement in terms of specific dates. However, the PM seemed to be understanding and flexible with the timelines, at least verbally.

DESIGN PHASE

The project official design phase started on September 11, 2018 as per project timeline (see Figure 3 on page 85). Although that was when Anne was supposed to start drafting the design plan, she was still making revisions to the content analysis map. In fact, the last version of the content analysis map she uploaded onto the server was on October 18, 2018 (see Appendix H). At this point in the design phase, she did not have a target audience defined and had not gained agreement on the approach to the distribution of work related to Shared Ownership because her project still did not have SMEs or stakeholders assigned to it. However, due the tight project timeline, Anne had agreed to move forward into the design phase by starting to draft a design plan. As Anne herself explained in her interviews, instructional designers can still move forward with little information.

> For example, with [curriculum X] redesign, I didn't know what was going on with the other two roles [the other two potential target audiences]. But that's not going to stop me from doing the regular design of [curriculum X]. I think you have to

look at it that way. You can't [removed] throw up your hands because there is one thing that we don't know about the problem. What do you know? Is there something that you can move forward with, right? And so if I really do feel like I don't have the information, I would really question with my manager about what we're doing. Why are we doing this if I don't know what we're solving? […] But if there is something for me to move forward, and you do know, I know this part of it, at least I can start outlining. (Part of interview 1, when participant talked about how she moves forward with designing a solution even when she does not have all the information)

Another meeting with the instructional media specialist (IMS) on September 20, 2018 confirmed that Anne was moving forward with making design decisions with the information she had. In the meeting, Anne provided the IMS with the server location to all the existing curriculum X courses. She requested that the IMS listed all the videos available and extracted them for more specific content analysis. In addition, although systems simulations were no longer under consideration, Anne wanted the IMS to also list the existing simulations and extract them from the courses. She wanted to take a look at the systems simulations to consider how she would reuse the content of those media assets in the redesigned courses. For that, Anne asked for my help. Although I did not have a role in the project, Anne was aware that I was one of the instructional designers who worked on the original curriculum X design effort. More specifically, I had also created most, if not all, the systems simulations within the curriculum. The request was simply for me to

direct the instructional media specialist (IMS) to the exact courses containing systems simulations and provided help as needed with the technical part of it.

Having noted that Anne had taken all those steps toward curriculum X redesign, data showed that she did not start drafting the design plan until September 24, 2018, when the first iterations of the document were made available on the server. Other data points also indicated that Anne did not start working on the design plan as per project timeline. To recall the brief media check-in meeting on September 11, 2018, Anne had agreed with the project manager (PM) that it was time for her to move onto the design phase. At the same time, she had asked for some "wiggle room" for the design plan as she would be out of town to receive a company-sponsored Kirkpatrick certification. Also, the date of the initial design plan drafts aligned with the time after Anne had met with the initial subject-matter experts (SMEs) as we will see below.

Only towards the end of the second week of the official design phase, the initial project SMEs were identified, and Anne was able to meet them and ask critical questions to help her identify the target audience. In two days, Anne had three meetings with SMEs from three different regions: Americas, Asia-Pacific, and Europe. Each SME was an expert at a specific call center role. One was a senior call center representative in the role for which the original curriculum X had been designed. The other two were senior call center representatives in the roles that were still under consideration as potential target audiences. The first SME meetings were very straightforward. Anne's goal was to gain knowledge of the target audience. She attended the meetings with her notes and a list of questions. It was clear she was on a mission to get her questions answered, and she knew the SMEs held

critical information that would inform her instructional design process and strategies. Because curriculum X was designed around the Online Order Review Model, Anne was very direct—"which of the steps in the model apply to the work your call center representatives follow?" Most of the questions were related to understanding the on-the-job task workflow and desired behaviors. Anne also asked for existing training materials as well as possible procedure documents in order to better understand the job function for which she would potentially design. Anne was still trying to confirm if curriculum X would have to be adapted to include the other two similar roles. Those descriptions can also be observed in the follow-up emails Anne sent to the SMEs. After each meeting, she sent the SMEs more questions via email (see Appendix I).

> Thanks again [SME 1] for meeting with us yesterday and thanks for getting us access to the [call center role] [web]space. I wanted to send a few follow up questions.
>
> - Would you be able to share the [call center role] training that you currently use for new hires?
> - Are there any particular processes on the [call center role] [web]site that you would recommend reviewing (high priority processes)?
> - Could you give us 3-4 critical behaviors you expect your new [call center representatives] to be do on the job (1-2 particular to [your call center representatives)

- You mentioned that [name of a person] in [city in the Americas] would be a good contact in [city in the Americas], as he developed the training? Would we be able to reach out to him directly?

- I will send you a link to the current videos that we have for [curriculum X]. Could you review and let us know of any red flags/areas that may not be relevant to your audience?

Thanks and look forward to talking further.

[Anne] (Participant's email to the first SME she met on September 20, 2018)

Three days after meeting with the third and last SME in this first round of meetings, initial iterations of the design plan were made available on the server, indicating that the SMEs' knowledge was critical in informing the design process.

Despite the clear delays in access to SMEs and essential instructional design information, the project manager (PM) sent an email to Anne, only three days after she had started drafting the design plan, reminding her of the project timeline commitments they had made. Although the PM acknowledged the timeline challenges, he focused on the deadlines and actions needed by those set deadlines.

[Anne],

I was thinking about some of the commitments we made to a timeline and some of the challenges we are facing at the moment:

1. Design plan completed and reviewed by the end of this week. ([LCMS] training going on this week)

2. Design plan presentation to stakeholders SMEs 10/1/2018. (We are still identifying who are Stakeholders are)

3. Starting to create content next week.

How do you feel about the items mentioned above?

Thanks,

[Project Manager] (Email from the project manager to the Anne on September 25, 2018 at 5:13 p.m. Central Time)

In her reply, however, Anne candidly, but clearly, indicated the impossibility to commit to those dates without access to the proper sources of information, such as stakeholders.

Hey [project manager],

Thanks for bringing up these points. I do feel like these are real challenges. I was still planning on sharing the design plan with [instructional design team leader] this week, but I do feel like it won't reflect some of the unknowns (scope of [potential call center roles as target audiences], Tool strategy for demoing/access to [tool utilized by call center representatives training under curriculum X]).

And agreed if we don't have stakeholders identified, it will be hard to run the design plan by them. ;)

I could start creating skeletons of the [Online Order] Review Model courses next week, but agree once we get beyond the basics, there is still some design planning/discussions/review that still need to happen.

[Anne] (Participant's response to the PM email was sent on September 26, 2018 at 8:48 a.m. Central Time)

In spite of her reply, from September 24, 2018 through October 2, 2018, Anne posted several versions of the design plan online, suggesting that she was not behind schedule out of her own volition. Although the majority of the versions contained minor revisions, the fast development of the design plan after the SME meetings indicated that the SMEs' knowledge was essential to the progress of the instructional design process. A lot more information was still missing, however. Other agents of this complex instructional design process were still needed—stakeholders, for instance. Nonetheless, this complex system continued to function dynamically.

As Anne was working on the design plan, the project manager (PM) was also checking on the instructional media specialist (IMS) progress. Based on a previous agreement, the media team had committed to updating existing videos and graphics, and creating new graphics and animations if necessary. The first set of media assets requested was existing curriculum X videos. Anne wanted to share the current videos with the SMEs so they could check them for content accuracy and also because the target audience had not been finalized yet. Videos were one more resource that could help her make a final

recommendation on the appropriate target audience for curriculum X. After the initial SMEs meetings, however, an email from the instructional media specialist (IMS) to the project manager (PM) suggested that Anne had gained some clarity in regard to content of the video and had advised the IMS on updating video content.

> [PM],
>
> I updated the Outbound Communications video and I will work on the [Video Title] one next. Currently finishing up other projects so they are complete before my [internship] ends next week. I will be handing off [curriculum X's media assets] to [another visual designer] and the videos to [video editing contractor]. I will email you all when the handoffs are complete.
>
> [IMS] (Email from the instructional media specialist to the project manager with copy to the instructional designer sent on September 26, 2018 at 7:32 a.m. Central Time)

All those conversations were happening in parallel. They were informing and contributing to the design process. Another example of the dynamics of the information system was consultations the instructional designer continued to have with the initial SMEs via email (see Appendix J).

Finally, by mid-October, another important piece of information came through a Shared Ownership initiative leader within the learning and development (L&D) organization. The target audience would remain the same as the one of the original curriculum X. Although Anne had made significant progress on the design plan and had uploaded what was considered the final version onto the server on October 3, 2018, the

confirmation of the final target audience was still pending agreement from the call center directors. With that obstacle removed, Anne believed she could start making more progress on the instructional design strategies. The next step was meeting with the stakeholders and gaining agreement on the approach to sharing content redesign and development with the call center partners. That was achieved towards the end of October.

CHANGES IN ORGANIZATIONAL STRUCTURE

Several changes happened during what was initially supposed to be the development phase of curriculum X redesign project as per project timelines. Mostly, they were organizational changes that prepared the learning and development (L&D) organization to approach and support training design differently. Those changes also impacted the entire Shared Ownership initiative resourcing. As a result, efficient project management approaches were implemented, which in turn led to stronger partnerships, more clarity, and a much more structured approach to curriculum X redesign effort.

On October 10, 2018 there was a design team meeting with the instructional design and instructional media teams. In the meeting, it was announced that many functional roles would be rearranged starting on that exact date. Anne, the instructional designer who was the participant in this study, was being promoted to instructional design team leader. And the instructional design team would no longer be two groups under two team leaders. The instructional design team leaders were being put into curriculum manager roles, with no employees reporting to them. Three other instructional designers were also given curriculum manager roles. One of them would start right away as a curriculum manager for all the call center curricula being redesigned under Shared Ownership, including

curriculum X. Another instructional designer moved into an interactive media designer role in the instructional media team, and under such role, would support the learning and development (L&D) organization build an infrastructure to implement interactive media for learning purposes. That role would initiate an area of expertise that did not exist within the instructional media team before, and therefore, would have no impact on curriculum X redesign. The instructional media team was also getting a multimedia designer, a visual designer, an audio/visual producer, and it would soon be hiring a video editor and a media producer. The media team members would support Shared Ownership initiative, and eventually, curriculum X redesign. However, since those new roles were too recent, there was no clear information about how curriculum X would be directly impacted.

This reorganization of roles had a major impact on all curricula under Shared Ownership, and it would also impact all other design projects onward. Although the instructional design team was being reduced, as it lost three instructional designers and two instructional design team leaders to curriculum management roles, there was a potential for instructional design projects to be better coordinated, integrated and aligned under Anne's supervision as should would be a single instructional design team leader. Also, three new instructional designer contractors would start on October 15 to support curricula redesign for Shared Ownership, including curriculum X.

The curriculum manager role, which did not exist within the learning and development (L&D) organization before, was another gain. Since the organization designed learning products for global retail audiences, supporting approximately 70,000 employees worldwide, L&D would finally have dedicated employees to assist subject

curriculum work. Therefore, each curriculum manager was assigned one subject: retail store operations, retail call center operations, sales skills, products, services and core technology compliance, and leadership, employee development and company culture. Structurally, the curriculum managers would report to the managers of a group called programs, not to the overall design manager, who managed both the instructional design and instructional media teams.

Within two weeks after the announcement, the instructional design team gained one instructional designer, who moved from another team within L&D, three instructional designer contractors, as it had been previously announced, and lost two other instructional designers. One of the instructional designers who left the role moved into a new role within a new team in L&D called Learning Analytics. Learning analysts would report to the same managers of programs and curriculum managers. That role was not clearly defined yet, and therefore, there was not an understanding of how it would impact Shared Ownership if at all. The other instructional designer left the company. He was the only other person in the instructional design team, besides the participant of this study and myself, with a formal background in instructional design and curriculum and instruction.

By describing those developments here, I hope to communicate a sense of interrupted flow. In other words, I hope to paint a picture of an instance in which changes in the environment triggered adaptation in the instructional design ecology observed in this study. In sum, these were the changes that directly impacted curriculum X redesign:

1. On October 10, 2018, Anne, the instructional designer participant in this study, became the instructional design team leader.

2. Some instructional designers became curriculum managers, each with a focus area. The curriculum manager responsible for retail call center operations would support all curricula being redesigned under Shared Ownership.
3. On October 15, 2018, three instructional designer contractors started working for the learning and development (L&D) organization, reporting to Anne as the new instructional design team leader. One of them was assigned to curriculum X redesign and would be trained to become the new design lead for curriculum X.
4. On October 19, 2018, it was announced that a new project manager was being assigned to the entire Shared Ownership initiative, and therefore, to curriculum X.

Since Anne, who was the instructional designer leading curriculum X redesign effort, became the new instructional design team leader, she could no longer lead the instructional design process of the entire curriculum. Her priorities changed, her tasks changed, and her time dedicated to curriculum X redesign was limited. Thus, she would adapt the development phase of curriculum X to her new reality and prepare the instructional designer contractor to take on the role of design lead. Despite of that major change, I continued observing Anne's practices as an instructional designer until she handed over her final deliverable in curriculum X redesign project. In addition, Curriculum X's instructional design effort gained a new project manager, who revised the instructional design process timelines to meet more realistic expectations. Figure 5 below shows that content development would begin two months later when compared to the initial project timelines proposed by the first project manager.

Figure 5: Partial Project Timelines Created by New Project Manager

[Curriculum X]

	Start Date	End Date
Discovery	08/20/2018	09/10/2018
Design Phase	09/11/2018	10/26/2018
POR sign-off	10/25/2018	11/26/2018
Content Creation	12/01/2018	
Production Handoff - L&D		
Production		
Closure		

Note. Identifiable information has been replaced with content in brackets.

Discovery refers to the Analysis phase in ADDIE models.

POR stands for plan of record. It refers to the document that will be presented to the call center stakeholders for agreement on the division of work between global and regional courses.

Project Handoff indicates the date the courses will be handed over to L&D editors for proofreading, followed by translation services, finally LMS administrators for publishing.

THE PLAN OF RECORD

The new project manager (PM), to whom I will refer simply as project manager from this point on, created a new checkpoint in the project timeline called POR sign-off. The plan of record, referred to as POR by the project team, was a document that would be presented to and shared with the call center stakeholders. In this document, Anne summarized the work she had done related to content analysis and proposed the distribution of work between the instructional designer contractor in her team and the call center regional design partners. This document would be a contract between the learning and development (L&D) and the call center organizations to solidify the final agreement on curriculum X's target audience and content categorization into global versus regional. After the call center stakeholders signed off on the proposed work, Anne and the PM would work together on a master spreadsheet containing all the details necessary for the execution of curriculum X redesign—from timelines and deliverables dashboard to a detailed course list containing each course title, topic, brief description, instructional strategy, region and designer assigned, and word count estimate. This master spreadsheet contained all that information for curriculum X as well as for all the curricula being redesigned under Shared Ownership.

Anne would meet the call center stakeholders on October 25, 2018 to present the plan of record. Thus, the day before, she had the opportunity to present the document to and rehearse her presentation in front of the project manager (PM), the curriculum manager (CM), and one of the Shared Ownership initiative stakeholders within the learning and development (L&D) organization (this time, not the instructional designer's former

manager since she had been moved into a curriculum manager role with a different focus area). The meeting was very well structured. Anne presented each page of her document, and the Shared Ownership initiative leader would coach her on what to say and what not say. He also made specific recommendations regarding word choices and mentioned the importance of being a good wordsmith to ensure clarity and not have the call center stakeholders hung up on ambiguous ideas.

New pieces of information were revealed, clarified, or confirmed in that meeting:

- The target audience would remain the one of the original curriculum X. And the Shared Ownership leader wanted to make sure Anne was very clear about that in her presentation. He wanted to avoid any possibility for new requests from call center stakeholders at this time.
- The course list number had been revised from 37 to 44. And L&D would be responsible for redesigning 20 of those courses as they contained global content.
- The General Data Protection Regulation (GDPR) team was very pleased with the approach L&D had chosen to pursue systems training—step-by-step processes with screenshots containing dummy customer data.
- The courses could not contain links as the learning platform would block links for security reasons.
- The courses would be developed and delivered in waves for SMEs and stakeholder reviews. Details about specific dates would be agreed upon at a later time. However, the project team wanted everything uploaded onto the

learning content management system (LCMS) by April 1, 2019 so that they could train the trainers in using the course list flow and the resource materials.

With the expected date in mind, the project manager (PM) emphasized that "ideally, course development would start immediately." Otherwise, there would be a risk of training materials not being ready on time. Anne was also instructed to list the SMEs that had been assigned to curriculum X and confirm their expertise with the call center stakeholders. They wanted to secure global SMEs to ensure the content they were recommending as global contained accurate global content. Finally, the PM requested that Anne disclose in writing that an instructional designer contractor would be the official instructional designer for curriculum X. The PM wanted full disclosure that Anne would no longer be the instructional designer for the project as she had moved into a new role.

The next day, Anne presented the plan of record to one call center stakeholder in the presence of the PM and the Shared Ownership initiative leader. The meeting was "weird," as Anne called it. The only call center stakeholder present in the meeting did not engage much. She did not ask clarifying questions, raise concerns, and did not agree or disagree with anything that was presented. In spite of that, the call center stakeholders did sign off on the proposed agreement for curriculum X redesign execution sooner than expected. Although they had until November 26, 2018 to review and negotiate the contract, the approval came in earlier, and on October 31, 2018 the PM communicated the next steps via email to the project team.

Hello, all!

Some status updates notes from today:

[Curriculum X]-

- [ID] and [PM] will be writing the POR content list this week and then work on the wave approach for this content
- [ID] will update the resources list once she has her SMEs
- [ID] will follow up with [instructional designer contractor] on some content around [curriculum X]

Let me know if you have any questions!

[PM] (Email sent by project manager on October 31, 2018 at 2:33 p.m. Central Time)

On November 14, 2018, there was a progress update meeting with all instructional designers working on the curricula under Shared Ownership. The project manager (PM) called upon each instructional designer for a status update. When Anne was called, she explained that it was her first time coming back "after being away for a number of things, including facilitating Shared Ownership training second day, which was fun." She mentioned that the last time she did any work for curriculum X was when she worked with the PM on a course list for the plan of record.

In her status update, Anne stated she was not sure the course numbers were accurate for what the regions will be designing. She also questioned the What/Why versus How/When approach that guided her through the categorization of courses into global versus regional. Anne mentioned that after taking a closer look at the course list, there are some courses that address How/When processes, but are more global in content and should be redesigned by the learning and development (L&D) organization. At the same time, she

was concerned that would add too much work to L&D as she understood L&D is overwhelmed with work for Shared Ownership.

Anne's former manager, who had moved into a curriculum manager role, was attending the meeting, and asked whether she could share her recommendation. Differently from how she used to direct Anne, she spoke candidly, but gently this time. She expressed that she did not see a risk with having the call center design partner redesign the How/When courses even if they contained global content. She showed support to Anne by expressing that she liked the Anne's initial approach to the division of work, and since they had gained agreement, there was no risk in keeping the distribution of work as it was. The project manager (PM) agreed with the former instructional design team leader and shared her screen to show the deliverables listed in the plan of record. She explained that the course design distribution was fair. There was a total of 45 deliverables. The L&D organization would develop 22, whereas call center design partners would develop 23.

The PM, then, asked Anne to focus on deciding which courses would be delivered in waves one, two, and three. She reminded Anne of a new checkpoint—L&D leaders (design teams manager and other leaders) would need the final course list by December 3, 2018 for review and approval. Therefore, it would be important to have the list ready at least after the company's Thanksgiving shutdown. The PM stated that Anne did not have to wait for that checkpoint to start course development. If she felt confident, she could advise the instructional designer contractor to begin course redesign, while understanding the risks of starting on course development before L&D leaders' approval. In order words, they could recommend changes.

The curriculum manager (CM) for curriculum X was also attending the meeting and stated that she wanted to connect with Anne separately. The CM explained that although the learning and development (L&D) organization staff would be off for the holiday, the instructional designer contractor would continue to work as per his contract. Thus, there was an opportunity for them to make a plan to have him work on some course design over the holiday break. Anne agreed to the idea and disclosed that before she left to prepare for her new role, she had shared her server folder with the instructional designer contractor. That way, he could start becoming familiar with the work she had done—all the project design documentation, design plan, existing materials to be redesigned, and course outlines on which she had already started. At the same time, she acknowledged that she had not checked with him after she came back from her new manager role training. The project manager (PM) also asked to have access to the list of courses Anne would recommend the instructional designer contractor to start redesigning. The PM explained that the instructional designer contractor was assigned to other curricula under Shared Ownership and they needed to make sure he received a reasonable workload.

Finally, Anne stated that she had been contacted by the call center stakeholders via email with a final list of SMEs. And she wanted to know if there was a particular protocol to reach out to them or if she could just contact them directly. The PM advised Anne to reach out to the stakeholders with that question, and confirmed that there was no protocol required by L&D.

DEVELOPMENT PHASE

Following the new timelines, the official development phase started on December 1, 2018. Although she was no longer the instructional designer of curriculum X, Anne wanted to redesign at least one course before leaving the project in that capacity. She had worked diligently through a content analysis, delivered a design plan on October 3, 2018, right before taking on the new leadership role, had worked on a plan of record (POR) for the execution of this redesign effort, and had already started outlining some courses, as she had previously mentioned. She did not want to leave the project without making a course development contribution.

Thus, Anne chose to develop the very first course in curriculum X's course list. The course was initially called Understanding Your Role. It gave an overview of the call center role on which the learners would take after training. It introduced the importance of that specific call center role, the skills necessary to be successful in it, and the systems and tools the new hires would utilize once on the job. Anne chose to develop that course based on her familiarity with the course content, and the understanding that it would require minimum development effort.

On January 15, 2019, a global SME contacted Anne, the curriculum manager and the instructional designer contractor to let them know that he had met with worldwide call center trainers and they had agreed on what he called "the outstanding points." One of those points impacted the course Anne was preparing to redesign:

At this point, there are potentially two modules that we recommend be WW [worldwide] and owned by [L&D]. We have materials for both of these modules if you are interested in leveraging anything that we have:

- **What is [X]?** (this doesn't have to be a standalone module and could be included in "Your Role," but the concept is WW)
- **Escalating Chargebacks and Disputes** (this is currently outstanding, as the process appears to be WW in [procedure documentation web portal], but I got some conflicting information about whether or not all regions truly follow the process; if we find out it's regional, we will own this module and recommend that the procedure be clarified with regional callouts)

As always, thank you for your help and partnership on this. Let us know if you have any questions!

[Global SME] (Part of an email from the global SME assigned to curriculum X sent to Anne, the curriculum manager and the instructional designer contractor on January 15, 2019 at 11:56 a.m. Central Time)

On the following morning, Anne responded to the global SME and asked to take a look at the course that would impact her redesign work:

Hey [Global SME],

Could you go ahead and send me the What is [X] content? I haven't gotten a chance to touch base with [curriculum manager] yet over that course, but would love to get started by taking a look at it.

[Anne] (Email sent on January 16, 2019 at 9:47 a.m. Central Time)

Another contribution to the redesign of the "Your Role" course, as the project team referred to it, came from the curriculum manager (CM). Since that was an introductory course and all curricula under Shared Ownership would have a similar course to introduce the potential new hires to the role they would be taking, the CM created a template to standardize the course flow and format. That decision was also based on the fact that the new Content Management System (CMS) required a different file format from that of the original course.

Hi team,

For those of you on the Fundamentals '19 project [Shared Ownership] I wanted to let you all know that [another curriculum manager] and I have completed a course "template" that you can all use to create your own [Line of Business] in the [call center]. You can find that Keynote here [link removed] on [server].

Everything in brackets should be changed to reflect your unique text. Also feel free to add slides that you may need in addition to these. This will help us have a unified structure to this content, but we also understand that [there] might be some unique additions.

Please let me or [the other curriculum manager] know if you have any questions.

Thanks,

[curriculum manager] (Email sent to a list of people on January 16, 2019 at 1:46 p.m. Central Time)

The instructional designer contractor had started redesigning courses as per the project timeline. Anne, however, only began her course development in the new year, 2019. As she was aware of the work the instructional designer contractor was doing, she requested whatever materials the instructional designer contractor already had on the course to be redesigned and confirmed she would be taking ownership of it:

> Hey [instructional designer contractor],
>
> When you get a chance could you send me whatever you have for the Understanding Your Role in [curriculum X]? Whatever draft it is in and any source content? I'll build out the final course.
>
> [Anne] (Email sent to the instructional designer contractor on January 16, 2019 at 4:27 p.m. Central Time)

Since the work to be done was a redesign of an already existing course in the original curriculum X, Anne already had something upon which to build. Especially now, with a course template and all the previous materials to get started, the redesign effort had a fast development cycle. On January 17, 2019, Anne had what she called "a skeleton of" the course, which she shared with me. The next day, she shared her first draft with the instructional designer contractor and the curriculum manager (CM) via email.

> Hey [instructional designer contractor] and [CM],
>
> I wanted to get your input on my approach with the Your Role - [removed] course. There are a few things I need to complete and images need to be replaced.
>
> I did include slides around the [x] engine review process and manual review. These were originally part of the source materials. However, if we think that the guest

speaker could speak to these points, I could remove the slides. Let me know what you think. I'm fine with leaving them in there, but just wanted to get a sense if this needs to be tightened up at all with our new approach.

[ID] (Email sent on January 18, 2019 at 3:30 p.m. Central Time)

This quick internal review process and consultation continued via email. Three days later, on January 21, 2019, Anne made the course available on the server for SMEs review. By that time, after all the project changes, the curriculum redesign effort had about five SMEs. Because the course was short and simple, the SMEs review happened mostly asynchronously. Two of the SMEs provided feedback in writing by commenting on specific areas of the course. The review cycle with them happened online because they were located in other continents. The SME located in the Americas, however, requested a face-to-face meeting to provide his feedback. I was not invited to that meeting, and only became aware of it through an email exchanged between the project manager (PM) and Anne. In the email, the PM checked with Anne on the status of the SME reviews. Anne responded with a brief summary of the SMEs review process:

Hey [PM],

I can speak to the course that I helped out with (Your Role). The stakeholders left comments on [server] and [global SME] met with us to go over his recommended edits. I have made the updates to that particular file.

I'm not sure how far [instructional designer contractor] got with the rest of the files. And I think it is a good idea to ask for an [learning content management system] Developer to build out these courses in the system.

[ID] (Email sent to PM on February 5, 2019 at 7:10 a.m.)

The review cycle ended on February 4, 2019. Anne made the necessary content revisions as per SMEs feedback, and on February 5, the course went to the editors for proofreading without stakeholder reviews. That was an uncommon practice in the learning and development (L&D) organization. Common practice in L&D was to have stakeholder reviews cycle and approval. Then, after revisions, the course would be sent to L&D editors for proofreading. Also, as part of the new workflow due to the new learning content management system (LCMS), the instructional designer who developed the course would receive the course back from editors, revise the writing as necessary, and finally send the course storyboard to an assigned systems developer, who would then, build the course in the system. However, because Anne needed to focus on her new role, she delivered her final course to the editors and communicated that the instructional designer contractor would take it from there.

Finally, implementation and evaluation were not observed. Those two phases commonly recognized in traditional instructional design models were not common practice in the instructional design process within L&D. Also, those did not happen in this observed case because Anne was no longer the instructional designer leading the design effort of curriculum X and had to move on to other tasks with higher priority for her new role.

CHAPTER 5: DISCUSSION, LIMITATIONS, AND IMPLICATIONS

Rowland (1992) stated, "we have a large body of literature that describes and prescribes how to design instruction but a poor understanding of what expert instructional designers actually do in practice" (p. 65). Others suggested that we need more studies that observe the instructional design process in natural settings so that we learn about what instructional designers really do in the workplace and help close the gap between theory and practice (Gibbons, 2011; Kirschner, Carr & Merrienböer, 2002; Richey, 1998; Rowland, 1993).

In order to understand what instructional designers do, I observed one instructional designer in a learning and development organization within a large multinational corporation going through the design process from project intake until delivered learning product. Guiding my observations was the research question:

- How do instructional designers design from project intake to designed product?

To answer that question, I used a case study methodology and through rich descriptions I narrated:

- The contexts of the instructional designer, the target audience and the product being designed.
- How the design process was distributed or coordinated across the instructional design ecology.
- How the instructional designer adapted the process and/or the product being designed to the needs, expectations and demands of the design context.

- How the embodied aspects of the instructional designer, the target audience and the product being designed informed the design process.
- How the instructional design process was enacted—observable types of situated practices or activities in which instructional designer or learners engage to inform the design process.

Meeting notes, emails, artifacts, and two participant interviews were used as data sources, and some of those data points were utilized to exemplify the case.

In this chapter, I will discuss the results within the framework of complex systems, address the limitations of this study, and finally, present the implications of this case to the field of instructional design.

Discussion

DISTRIBUTION

Hutchins (1995) stated,

> "[a]ny attempt to explain the cognitive properties of such a larger system without reference to the properties of its most active integral parts would be deficient. Similarly, though, any attempt to explain the cognitive properties of the integral parts without reference to the properties of the larger system would also be incomplete" (p. 287).

The instructional design process observed in this study saw one instructional designer (ID) collaborate with multiple individuals, who informed the instructional design

process, and helped the instructional designer make decisions related to target audience, content analysis, distribution of work, instructional approaches, instructional media, course template, and file format. The instructional designer also worked with tools and technologies that informed and mediated the instructional design process, helping her offload some of her mental design capacities onto those tools. In addition to the role of the individual agents, I have also described the role of the environment in informing, shaping, and reshaping this dynamic ecology of instructional design.

The conditions under which curriculum X and the delivered course were designed offered the instructional design process a great dependency on its context, as it was confirmed by Anne:

> Because in this [Shared Ownership] project there was a lot more collaboration than I think there even normally is because [the call center partners] were doing design as well. And so something that you would be creating could affect what they were [creating]. So there was just a lot more collaboration between us and the training teams because they were actually doing instructional design too. (Participant's reflection of the context in a response to the second interview)

The Shared Ownership initiative provided some major obstacles to and, later, great opportunities for the instructional design process. The learning and development (L&D) organization leaders envisioned Shared Ownership as a solution to make the yearly process of worldwide call center curricula maintenance sustainable. Through that solution, they proposed strategies to reduce L&D's ownership of annual content redesign of call center new hire training worldwide. Very early in the project, at the kickoff meeting, we saw the

parameters of Shared Ownership inform the directions of the instructional design process—global content would be owned by the learning and development (L&D) organization and regional content would be the responsibility of the call center design partners. The instructional designer's (ID) immediate response was to look at the existing curriculum and map it according to general concepts of what and why versus specific how and when processes, which tended to go into details of regional policies and procedures. And that approach guided the entire process of curriculum redesign and coordination of work.

At the individual level, because Shared Ownership was still being negotiated, the instructional designer had no access to SMEs and stakeholders. Still, the instructional design process had been put in a tight timeline, and the instructional designer had to continue the design process with very little information. In addition, the stakeholders had expressed their desire to see curriculum X be modified to serve two other potential target audiences. With no SMEs and unable to define the target audience, the instructional designer focused on what she could do. In that case, she put her attention onto the content analysis of existing curriculum X courses. At the existing content level, the ID partnered more closely with the instructional media specialist (IMS), who contributed with her knowledge of the limitations of the learning content management system (LCMS), onto which the courses would be uploaded, and the new data protection regulations.

From a hierarchy perspective, the instructional design team leader was another strong contributor to the ecology of instructional design. She had a strong voice, and at times made assumptions that could have put the system at risk of collapse if knowledge, information, and tasks were not so widely distributed. For instance, a few times, the

instructional design team leader insisted that the redesign effort of curriculum X would be easy. She suggested that the instructional designer (ID) would be able to take courses as they were, change their file format to be compatible with the new LCMS, and upload them without redesign considerations onto the new learning platform. Although the ID did not dispute the instructional design team leader's assumption, she did not take any action towards that assumption either. That is, the ID, was cautious as she navigated the instructional design process, and seemed to use her expertise to take a different approach:

> It was from existing material, but there was a lot of back and forth because, you know, initially, it just seemed like sort of a simple moving to a new [file format]. There was a lot of stuff going on that it would have been really easy to just do sort of copy and paste from one [file format] to the other. But I think we knew it wasn't the right way to approach it. (Participant's reflection of some initial assumptions and how she handled them)

In a parallel instance, we observed hierarchy as a concept that can bring stability to the system when there is clarity of roles, openness in communication and negotiation, and opportunities for coordination. At the beginning of the analysis phase, for example, the instructional designer (ID) presented a draft of the content analysis map to the instructional design team leader. In that initial draft, the ID was attempting to map all the courses in curriculum X's course list and seemed to be overwhelmed with the amount of work she had to do. Looking at that initial draft, the instructional design team leader saw an opportunity for the ID to focus on global content only and expedite the content analysis process. Thus, she directed the ID to create a column for "Deliverables" to the right of the

"What/Why" column and eliminate the "How/When" column, which referred to courses that would be redesigned by the call center partners. That approach would make the content analysis map clearer and more relevant to both the learning and development (L&D) organization and call center stakeholders.

As presented in Hutchins (1995), in a balanced system, each individual must have a level of functional expertise. However, that does not mean that "tasks knowledge is partitioned in an exhaustive and mutually exclusive manner such that the sum of the individuals' knowledge is equal to the total required, with little or no overlap" (p. 264). In other words, if there is no overlap of knowledge, there will be difficulty in communication and understanding. At the same time, if there is too much overlap of knowledge, there is a risk of the system being trapped in lack of diversity of knowledge, and therefore, lack of innovation and creative problem solving.

The most obvious contributors to the instructional design process were the stakeholders and SMEs. The lack of access to those two groups of agents was mentioned several times in the data collected as a potential risk to the instructional design process, and therefore, to the initial timelines. The first SMEs brought the instructional designer (ID) knowledge of curriculum X's current and potential target audiences. The stakeholders were critical in confirming resources and partnerships, agreeing to the proposed plan of record, and approved the project deliverables. Finally, the second group of SMEs, after L&D's organizational changes, offered the ID information that was incorporated into the course she designed, and relevant feedback during the SMEs review of that same course. The importance of a partnership with stakeholders and SMEs was also mentioned by the

instructional designer (ID) in her interview responses as she reflected on one of the challenges to curriculum X redesign effort in the content of a tight timeline:

> I think the initial time frame was crazy. The expectations of when things were going to be delivered when we were still [trying to figure things out]. And that was adjusted. The SME access, stakeholder access [. . .] It's hard to create something when you don't have that partnership with somebody. (Participant's acknowledgement of the role of the SMEs and stakeholders in informing the instructional design process)

Although one may think that distribution can only exist across individuals and organizations, Hutchins (1995) demonstrated that we must account for distribution across technologies as well. Beyond offloading the mental capacities of an individual, the interrelationships between individual and technology are also an integral part of a complex system. Nardi and O'Day (1999) explained different metaphors for the uses of technology. In technology as a tool, they stated that "[n]ow we understand many tool affordances have an important social dimension. We can think of affordances as those properties of an object that neatly support the actions people intend to take with the object (p. 28). Later, they elaborated "[w]e would like to move beyond the human-machine dyad, expanding our perspective to include the network of relationships, values and motivations involved in technology use" (p. 30). Technology, as the authors claimed, can be a form of communication. Technology carries meaning as it "passes through different social situations" (p. 33). Finally, they expanded even further as they discussed "the strong

interrelationships among the social, economic, and political contexts in which technology is invented and used" (p. 47).

In this case study we observed many instances of the interrelationships between the instructional designer (ID) and technology. And as we read the ID's own words below, we can interpret the uses of technology for meaning making, communication, and even as part of a certain instructional design culture:

> I like to use the [concept map] tool for content mapping. I like that. And sometimes it's just like simple [note taking application] or [word processor], or something to just write out some ideas, you know? Sometimes it's just my notebook. Sometimes it's printing out stuff and writing on it. But then, I do like the structure of a design plan. Once you get a little bit more where you're going, I like having some structure that reminds me of the things that I need to think about. So, having that to work with so that I can communicate the things that if showed [the stakeholders] in my [word processor] document, it wouldn't make sense. So, I like having the freedom of using blank sheet of whatever or using something visual like a content map, which actually might be useful for communicating to somebody else. But when I think of getting more structure to it and sharing it with people, I like having a template or plan. (Participant's answer first interview's question about how she uses technology to support her design practices)

When asked about how she used technology in her design practices for curriculum X redesign project, the ID included other tools for communication and collaboration with SMEs in a worldwide project:

> For collaboration, we have regions across the world. So of course, the [video conferencing tool] for actual meetings, you know, to actually have that conversation; Not have emails going back across different time zones and so forth. Our simple tools of design plan, my own tools of using visual maps, outlines, and you know, our storyboards. I think those were the tools. (Participant's reflection on technology uses in a response to a question on the second interview)

Though not mentioned, we also saw the instructional designer (ID) use spreadsheets for her content analysis map and design document. And finally, the plan of record was a massive spreadsheet that was created and owned by the project manager, but was also utilized by the ID to input deliverables details and progress updates.

Despite not going into a discussion of the economical and political contexts of the interrelationships between the ID and the technology she utilized, I want to call attention to the design plan or design document. The design document is a technology commonly utilized in instructional design environments. Therefore, we can say that the design document is part of the culture of instructional design. It is a recognizable technology, and it is an integral part of the ecology of instructional design. As Cennamo and Kalk (2005) described, "[the design document] articulates the 'who, what, when, where, why, and how' of the project. As the conceptual blueprint for the project, it integrates all of the thinking that's taken place on the project with new research conducted during the Design phase" (p. 202). Differently from the design document, the plan of record was utilized specifically for the Shared Ownership initiative. It represented the formal contract and agreement between the learning and development (L&D) organization and the call center. And as it received

information input by the ID related to deliverables and design progress updates, it also bound her to that social contract, role assignment, commitment and responsibilities. Therefore, it also carried meaning at the interpersonal level.

EMERGENCE

As we saw in chapter 2, emergence is large scale coordinated spontaneous self-organization that happens as a result of individual behaviors in a complex system. At the same time, the behavior of each individual does not predict the system's behavior. Thus, emergence is the classic "the whole is greater than the sum of its parts" concept. So, we can say that the property of emergence is in itself simple and complex at the same.

In the observed instructional design ecology, we saw adaptation happen at different levels and dimensions. In her interrelationships with the artifacts that supported her design of curriculum X, we saw the instructional designer (ID) transform the content analysis map and design plan, revising and adapting them as she received feedback and new project information. The overall instructional strategies for curriculum X also needed to be adapted as the ID was unable to use systems simulations due to the limitations of the learning content management system (LCMS) and live system demos due to new General Data Protection Regulation (GDPR) rules. Along those same lines, there was new consideration of content presentation as the ID also learned that the learning platform would not allow for website links. The ID reflected on some of the ways coordination led to adaptation:

> As far as getting input and feedback, it was kind of part of the larger process of stakeholder review of our design approach for all the [curriculum X]. You know you can put your design plan together and have an approach, but you also need to

be prepared that there are things that can completely alter certain things. (Participant's reflection on changes at the design plan level in a response to the second interview)

The instructional designer (ID) reflected on the idea of adaption in several occasions throughout the second interview. In the passage below she explained that change is expected as part of the process. And that change can also be problematic at a larger scale, such as change in the scope of work:

> And I would say that's fairly normal. That's why I feel like design plans are a useful start. And I appreciate when you know, we go through with those stakeholders. But things always change in some way, whether little or, unless they go sort of like way beyond the scope. But there's always something you discover after you've created the design plan. (Participant's on adaptation as part of the process)

Still, on another occasion, the instructional designer reflected on having to adapt their design plan strategy because she was working with an entire curriculum. And having a design plan for each course would have not been feasible:

> We still have a little bit of a simpler design plan. And I mean, the design plan was just one piece of this sort of larger [curriculum X course list] flow. So we didn't do a design plan for each course. That's crazy. So I mean, it was a design plan for the [entire curriculum X]. (Participant's reflection on adaptation due to the scope of work)

The ID also brought up the idea of having to work with and adapt the instructional design strategies due to the limitations of the new learning content management system

(LCMS). However, once again, she did not perceive that as a major challenge, but instead, as a natural reconsideration as a part of the design process:

> I think for this one in particular, it wasn't an issue because we weren't trying something new with the design as far as, you know, stretching the technology, the templates of our LCMS, or anything. It was fairly simple, and we have a lot of great media already. So I don't think I had that challenge that I've seen in other projects with maybe constraints of the technology (…). (Participant's reflection on spontaneous self-organization as part of the instructional design process)

At another degree of adaptation, we observed mentions of specific changes to courses. For instance, in the first meeting between the instructional designer (ID) and the instructional design team leader, they discussed the idea of having to reduce course duration because the courses were too long. Although I was not part of that meeting, the ID noted course duration as a topic of discussion in the meeting summary she sent to me via email. Also, in other meetings, I observed the ID state that the courses were too "wordy" or too "text-heavy." Thus, in response to a question in the second interview, the ID highlighted course duration as something she did modify:

> Looking at a course itself, I considered what was going to come before and after it, you know? Was there an in classroom discussion? Is this something we can have sort of [shortened], you know? Our [curriculum X] courses before were long, right? Forty-five minutes and so forth. And just looking at it [and thinking], are there some things that we want to pull out into that discussion because we don't do these really gigantic long SGTs [self-guided training] anymore? So the things that we just want

to 15-minute briefly go over that, and then have them talk about it in the classroom discussion. So it's a slight change in design just because a couple of years and we have adjusted how we design our materials.

So the basics of it remained an SGT. And then, sort of dove deeper in the SGT before we kind of determined really what would make more sense. And in the classroom and discuss it. Like, why have it in, you know, 800 words on a page, or whatever, when you could actually have a discussion around it? So that was an adjustment. And it was interesting to go back to content that we had done before that we felt really good about it. And it is good content, but it is pretty dense. And it's pretty assumptive [to think] that someone would read that much. (Participant's reflection on adaptation due a change in the way the learning and development organization's approach to course design when compared to two years earlier)

Still at the course level, the instructional designer reflected on adaptation due to coordination with the call center design partners:

So things would just come up in conversation like "hey, I heard you have source material you know on this," or "hey, we're thinking about doing this course," and there're like "hey, we already created one like that. Do you want to leverage some of it?" So it just saved so much energy and time to have this partnership with the regions who were actually doing some design as well. (Participant's reflection on course content and design practices adaptation due to coordinated design effort)

Another course level adaptation observed in the data collection, although not mentioned by the instructional designer (ID) in her interview, was related to course

template and file format. Right before the ID started designing the "Your Role" course, her final deliverable, she reached out to the ID contractor via email and asked for older versions of the same course. The instructional designer contractor sent her two files—the course itself, in a presentation file format, accompanied by a trainer guide in word processor. Following that exchange, the curriculum manager sent the ID a "Your Role" course template via email. She explained that since all curricula under the Shared Ownership initiative would have that type of introductory course, she and another curriculum manager had decided to standardize that particular course for cross-curriculum coherence. The template sent by the curriculum manager was in presentation file format. And because all the information related to trainer guide was in the presenter notes within the same file, the ID did not need to have a separate trainer guide in word processor. That example shows adaptation of course template and format based on variable related to Shared Ownership as well as coordination of actions with other agents in the ecology of instructional design.

Finally, another level of adaption occurred in relationship to the restructuring of the learning and development (L&D) organization. Based on the data collected, the ID became the new instructional design team leader. With the promotion, it became difficult for her to continue leading the redesign of curriculum X. Training for the new role and competing assignments had become a priority. In addition, curriculum X redesign project gained a new project manager, who revised the project timelines to a more realistic schedule of reviews and deliverables, a curriculum manager, who did not seem to greatly impact the project, and an instructional designer contractor, who was being asked to execute the instructional designer's curriculum X redesign vision to the finish line. The data collected

indicated two instances in which the instructional designer (ID) briefly mentioned her trying to adjust to the newly implemented organization changes. In parallel, we also observed her disclose that she wanted to contribute with the redesign of at least one course since she had envisioned the entire redesign of curriculum X. Reflecting on those changes, the ID stated:

> So, of course, time constraints are always a concern. And just like, time constraints for me of like moving into a new role, you know. Or like, you know, there's a little bit of constraints working with new contractors who weren't familiar with [curriculum X]. Just the resourcing of the curriculum, of the new roles, curriculum managers, you know. There was a lot of stuff going on.

EMBODIMENT

After discussing distribution and emergence, I found it difficult to extract embodied actions from the collected data as if embodiment were a concept completely independent from distribution, and especially, emergence. In fact, I observed overlap of concepts. For example, when the ID stated that she uses mind mapping tools for content mapping, that is example of an embodied action. The ID used, at the very least, two of her sensorimotor skills—vision and touch—to create a document that would impact the dynamics of the ecology of instructional design. That document, when presented to others, would invoke a response. It would be an example of the environment changing the actor while the actor was changing the environment. It is the co-origination of action and meaning, which also brings us the concept of enaction.

Having made my point, I tried to look at the data from the perspective of embodied actions generating emergence, which was my initially proposed approach. That is, which interrelationships involved embodied actions that generated spontaneous self-organization? The first example of embodied action I observed was in the email the instructional designer (ID) sent to me on August 24, 2020. In her email, she summarized the meeting she had had with the instructional design team leader on the previous day. The first sentences of the meeting summary called my attention:

> After taking a look at the curriculum, I saw that there were 43 courses and we chatted about how we are concerned as to how this, or any of the other curricula could be completed and moved into the learning app [LCMS]/new templates/etc.
>
> We also talked about how this project will also be using the federated model, with our team working with the "What and Why" of the content (overviews, strategy, etc.) and [call center] teams would be working with the "How and When" of the content (practice activities, process, tools, etc.). (Part of participant's email)

It was the ID's first contact with curriculum X's course list that set everything into motion. After looking at the course list, she created the first draft of the content analysis map. Although that draft was revised several times, the approach to course design distribution remained the same throughout the project—"What/Why" versus "How/When." And it was the same approach the ID presented to the call center stakeholders for agreement on the plan of record. The entire curriculum X redesign project was planned around that approach.

I know the ID was part of the team that designed the first iteration of curriculum X in 2016. However, I do not know how she went about accessing curriculum X this time. Was it sent to her via email by the project manager? Was it on a server somewhere? No matter the path taken, the ID had to engage in physical and mental actions to access curriculum X's course. Then, she had to "study" it. Did she look at it on her computer? Did she print it? Did she take notes on paper? Did she comment on the course list file? How did she get to the concept of the "What/Why" versus "How/When?" Did she just come up with the idea by looking at the course list? Was there another document she looked at? Or did she access the actual courses to refresh her mind about their learning objectives, content and instructional design approach? Did she recommend the approach to the instructional design team leader or did the instructional design team leader direct her to categorize the course list that way? Still, no matter how the instructional designer went about getting access to the necessary materials for her content analysis, she ended up creating a spreadsheet to map the course list content. All those activities involved embodied actions.

Other large scale instances of embodied actions were observed in the meetings between the ID and the initial SMEs. In those meetings, the ID was trying to learn about two potential target audiences for curriculum X. The meetings were short, about 30 minutes each, and the ID tried to get as much information as possible from the SMEs within those timeframes. The instructional designer (ID) had a sequence of very specific questions related to job tasks and workflow of the potential target audiences. She also sent follow-up emails to the SMEs with more questions and some requests. The ID also shared the Online Order Review Model with the SMEs for them to verify if the model was applicable to the

potential audiences. The meetings with those SMEs were very different from the other meetings I observed. The meetings and the conversations were very structured. The ID had a clear questions script, and she was very intentional about taking notes. She also requested existing training materials from the SMEs. After what seemed to be a very detailed investigation, the ID concluded that curriculum X should not be modified to include the two potential target audiences suggested by the call center stakeholders. Later in the project, the stakeholders confirmed and agreed to the instructional designer's (ID) recommendation. Therefore, curriculum X remained to be redesigned for its original target audience.

In one of her responses to the second interview, the ID reflected on the scenario above-mentioned:

> I did feel stuck when I discovered that we were supposed to support these other two audiences that didn't fit within, you know? Because I didn't know. Like, they didn't have any stuff on [the procedure documents portal]. Like, I just didn't know. And so I went to the curriculum manager, and we had to go back to the business to verify things. And they were like, "no, don't worry. You don't have to support [them]. All we need to do is to get their materials onto [the LCMS], and you don't have to create a whole curriculum for them with this process." (Participant's reflection on her embodied actions)

Embodied actions might not be so obvious in the passage above. However, if we take a closer look, we see the instructional designer (ID) interacting with the environment around her, receiving information, and responding with actions. In a superficial way, let us

picture the ID hearing about the two potential target audiences. Then, she responds with some investigation: engaging in meetings, which will require that she uses her physical body to attend and participate in the meeting—getting her computer, touching the mouse and the keyboard, reading materials, talking to people, listening to what they have to say, taking notes, outlining, highlighting, and trying to make sense of it all. And the result of her investigation may have led her to write an email or a document to summarize and present her ideas. And at the end of this, we have the instructional design process going back to a more stable state. All the physical and mental actions in which the instructional designer (ID) engaged were embodied actions.

At another moment during the interview, the ID was reflecting on her practices, and disclosed some of her embodied actions that would be naturally adjusted after feedback:

> Talking to people, and listening to people, and then, also giving myself the time and space to just brainstorm, and outline, and structure, and content map. And then, also getting myself the time to create stuff that's not great at first. I just like to get the stuff out of my head. I think it's effective for me. [indiscernible] Because I think you can be paralyzed with the idea of having to create something perfect and effective right away. So for me, I find that useful. And talking to others, and running ideas by people, validating. So I think the communication and also the space and the permission to start creating something that may not be as totally related to the end result. (Participant's reflection on her practices in exploring the project information, playing with it, try to make sense of it, and creating something that will probably need revision)

In the passage above, the instructional designer (ID) paints a picture of her practices to a point that almost feels like a child exploring the world around them. They have a wealth of information, and they grab it, pull it, shape and reshape it to see how far it can go. Her description also brings a sense of space, movement, balance, and awareness of her practices in relationship to the initial project information that could exist in documents such as an intake form.

The embodied actions of the instructional designer (ID) can be observed throughout the project. It would be impossible to imagine designing in such a complex environment with so many project team members, so much information, and so many pieces to put together, and not engage any of her sensorimotor skills. In meetings, I observed the ID sharing her screen, writing, taking notes, revising, and interacting with the documents she had created. Also, in one of the first meetings between the ID and the instructional design team leader, I observed the ID take a very passive position, almost sinking in her chair without a voice or an opinion. In one of the first meetings with the instructional media specialist, however, I saw the instructional designer direct and guide the meeting and use her hands as she explained her vision. There was a sense of space, position of her body, and movement. There was physical coordination coupled with mental processes. Maybe the ID was also snacking on some food while working on creating some of the documents she creating. Maybe she put her feet up. Maybe she had an oil diffuser or some aroma that she liked to associate with intense activities that require focus. Maybe she listened to some relaxing music. Maybe she stretched. Maybe she left her office to get herself water. Or maybe she walked the trails around the office to open her mind when she felt stuck. The

possibilities are endless. And most of the ID's embodied actions generated some level of adaptation—of her approaches to design, the instructional strategies she had envisioned, the artifacts she was creating, and even of the system itself.

ENACTION

Similar to embodiment, trying to extract examples of enaction from the data collection for analysis and discussion runs counter to the very core of the complex systems framework. Still, for sake of demonstration, I have selected some sections of the data to reflect on how the instructional designer's (ID) perceptions guided her actions, and her actions shaped her perceptions in what Varela, Thompson and Rosch (1993) defined as structural coupling. With this understanding, the individual and the environment are "bound together in reciprocal specification and selection" (p. 174).

In the observed instructional design ecology, Shared Ownership's vision, goals, and agreements guided the ID's instructional design practices. The first sign of that was the conversations around sharing of content redesign effort. Global content would be redesigned by the ID, whereas courses that addressed regional processes would be redesigned by the call center partners. We have seen many instances of that consideration throughout this study. Yet, one issue that was not explicitly addressed in the data presented in the Results section of this study was the problem definition. Instructional design models and approaches talk about defining the learners' needs, and therefore the instructional goals, in the early phases of the instructional design process (e.g. Cennamo & Kalk, 2005, Dick, Carey & Carey, 2005, and Wiggins and McTighe, 2005). Some of those models and

approaches emphasize the importance of iteration and recommend revision of the instructional goals as the instructional designer learns more about the project.

In the first interview, when asked when, during the instructional design process, she defines the problem, the ID stated that "sometimes the problem has been defined or identified." And then, she elaborated:

> I mean, I think it's early. I think it's like, you know, in those initial conversation like "what are we trying to do here?" [indiscernible]. It's pretty early, before you get into any sort of research or analysis. But then, in that, you may be determining a little bit more. You might get sort of a vague [problem] first. And then, when you're talking to [the stakeholders], you'd be like "oh, okay, so this is what's actually happening," right? So I would say [it happens] through discussions. But again, hopefully that's early. I've seen when people have something they've been working on, and the question comes up like "what are you actually trying to do?" And then, that's difficult. If you've gotten to a point where you have an actual deliverable of a learning experience, and you still don't know the problem that you're trying to solve, that's a problem. It should be early. (Participant's reflection on when she identifies the problem)

In the first interview, the instructional designer (ID) expressed her view that sometimes the problem has already been defined. But then, she clarifies that the problem may start as vaguely defined and is more clearly defined once she moves through the process. In her second interview response to a similar question, the (ID) stated about identifying the problem during the curriculum's X redesign process:

> I feel like I normally would define a need. But with this, because it was a small piece of a larger project, which was sort of this new hire need to know how to do their job, I didn't spend a lot of time going into why they need to know this, you know? It's been pretty established that this [Online Order] review model that had been created had been useful. It wasn't so much like there was a learning gap. It was more like we're having new people who need to be skilled in the same way that our currently [call center role] [representatives] are. (Participant's reflection on when during the process she defined the problem)

In her response to problem definition, the instructional designer (ID) seemed to assume that the problem had already been defined. As she stated, "[i]t wasn't so much like there was a learning gap." However, as she reflected on the issue of target audience in a response to a different interview question, she stated:

> I will say that there were two audiences that we originally thought we were going to be able to use the workflow with [potential target audience 1] and [potential target audience two], [only] to find out that their flow was just totally different. And so it changed how we supported them for this new hire [training] because we couldn't like Frankenstein it for how they do it. So we didn't release that course to them because it would have made no sense. (Participant's explaining the problem related to the potential target audiences)

Thus, the learning goals were not clearly defined at beginning of the project as the ID had stated. In fact, it was not until mid-October when the issue of target audience was finally resolved. That is, it was only in mid-October when the ID got confirmation that the

target audience would remain the same. As the target audience was confirmed, the call center role workflow, represented in the Online Order Review Model, was also confirmed. In other words, those were the two pieces of information necessary to ensure that curriculum X learning goals would remain the same.

During the second interview, the ID referred to the issue of undefined target audience multiple times. In the passage below, the ID explained how she investigated the issue, and came to the conclusion that the other two potential target audiences would not fit in:

> I would take a look at their [presentation files], their outlines, and I'd be like ["no"]. Because they would say like "well, I don't know if the second and third steps work." And then, I would look at their process, and it was just totally different. And I think they were trying to be agreeable and collaborative. But I mean, when we really looked at it, we were like, you know, "I'm not going to shoehorn your process into this one just so we can have one course," right? (Participant's description of how she went about making sense of the potential target audiences situation, and how she resolved the problem)

In the reflection above, the instructional designer (ID) explained that she looked into the training materials the initial SMEs used for their regional training, and once she made sense of it, she could not support the idea of having curriculum X encompass two other call center roles that had a completely different workflow when compared to the original target audience. She also explained in more detail how her process of learning more about the potential target audiences:

> It would come up either in a meeting with the regions. It would come up when the [initial SMEs] sent me their curriculum. And they might have said like "yeah, I think the [Online Order Review] model will work for us." And then, you actually look at it, and you're like "what?" And so, it was more of me discovering it and being like "Wait. How is this going to work with what you're doing?" So it was in discussions as well as kind of analyzing the content itself. I would look at [their processes] and how [it] worked, you know? It goes into the importance of design digging into any assumptions, or you know, any sort of go ahead. Like, things that probably would have been a big problem later if we hadn't discovered them early enough. Because we would have created stuff, and then found out that they were not useful, or not relevant, or that kind of thing. So we had to sort of scramble. So yeah, in conversations and in my own discovery. (Participant's reflection on how she went about discovering more information about and making sense of the potential target audiences)

The statements above related to instructional design problem definition were all examples of the instructional designer's (ID) guided perceptions and actions. Even if the ID described the problem as defined in an answer to one interview question, when she actually talked about the instructional design process, we saw her description match the data presented in the Results section of this study. And finally, the ID herself arrived to the conclusion that she had to dig into her own assumptions. And that was how she avoided a major problem later on in the process.

When talking about the design process, the ID also reflected on her approach and how her previous experience with curriculum X facilitated her design in this particular project:

> This had been a project I had been involved in before. So I was familiar with the process. So what I did and what I usually do is I take a quick sort of glance at past materials without going too deep into it because I don't want it to affect my design. And we had the objectives kind of identified. And what I did was create a visual map, a content map of it. That's what I usually do. So that I can, without trying to mimic what was already there, if I have these objectives, how would I outline this? (Participant's reflection on her approach to the design process and her previous experiences)

Along the same lines, the instructional designer (ID) also reflected on the factors that impacted her practices and decision-making process throughout the project:

> I think what happened with this one was that there was good design and good content. And it was more sort of looking at it with fresh eyes. But there was a good bit, and you don't always have that. I'd say that impacted it as well as this sort of shared ownership relationship of like how are these people actually training this? And what's working and what's not? As opposed to potentially years before. It was a little bit more of a bubble of having to create [indiscernible] material. So I'd say that collaboration affected the design, and knowing that we had good stuff to work with. (Participant's reflection on factors that impacted her design practices)

And she elaborated further when I asked if she wanted to add to it:

> I don't think so. I mean, I think just that the context of it being a piece of a larger whole and having to have that awareness of how it fit into in a larger project with a lot of people was an element that you don't necessarily have in all of the projects. But thinking and actually talking to the other designers "hey, I'm talking about this piece. Have you talked about that in the course, or is this the first time they're introduced to it?" It's just like, what's the experience of the learner? How do you make sure they're introduced to things so that when we call them later, you know, three hours later in the course, there's some consistency in what we present? So that, the collaboration part for working on such a large project on such a small piece of it. (Participant's reflection on her design practices in such a large project)

In enaction, we saw examples of the instructional designer navigating through the complexities of the instructional design ecology, unraveling the threads of information, using her previous experiences to make assumptions while also questioning those same assumptions. The instructional designer interacted with her environment through project team members and shared documents to make sense of things and make instructional design decisions, all the while focusing on what she wanted for the learner experiences to be. There was a lot of meaning making and problem solving, receiving from the environment while co-constructing it.

SELF-REFLECTION

I want to briefly highlight a couple of moments in this study that were not necessarily part of the complex systems framework. Yet, they offered an important pause for reflection. And they allowed us to understand how the participant's more intra-personal

communications might have guided her instructional design practices. In the first interview, I asked the instructional designer to talk about some common challenges she faces when she designs. She mentioned that time is always a challenge. Then, she went into a more personal self-reflection:

> I think a challenge that I had experienced is not being too emotionally connected to things that you create. So being comfortable and allowing others to give feedback on it. That's a challenge every time that I just have to personally work through it. Like, this is what it is, then you're going to get feedback, and you're going to make it better. And it's something that I have to, like, work myself up to. But it's part of the job. And then another challenge sometimes is seeing the impact or the value of what you do. I think that's a challenge because sometimes we can just like move on to another project, and then not think. How did that go? Do we have any insights? Or sometimes being so connected to it, you don't even want to know how it went because you're like, I'm so glad I'm done with it that I don't even want to know, you know? So, I think that's a challenge too. (Participant's reflection on her personal struggles as an instructional designer)

In the second interview, the instructional designer also had a moment to do some self-reflection. The last interview question asked her how her participation in this study might have impacted her as an instructional designer or her designed product. She stated:

> Thank you [for asking this question]. It's interesting to think about these things, and how we do things, and how we want to do things, and what challenges we have, and so forth. This reminds me what I like about this field, you know? So that's a

> good reminder. When I get too heads down, you know? That's what I enjoy. I just think it's important to think to both be confident and rely on your expertise as designers and creative people. But then, also see this as a partnership with the business and stakeholders to create something relevant, not just beautiful and creative. And really, the end result is not like we created a lovely learning solution, but that we've created something that's relevant to the business and the work. So that's what I think is important. (Participant's reflection on how being a participant in this study allowed her to reflect on her practices and what is important)

FINAL CONSIDERATIONS

In mainstream instructional design studies and in school, we learn about the steps necessary for one to conduct the instructional design process. In general, we consider a needs assessment, the learning objectives, the target audience, the instructional materials, and the evaluation instruments. We talk about theories, domains, models, approaches, methods, techniques, and strategies for learning and design. We also discuss technologies, multimedia, and the learning environment (face-to-face versus online). We mention the client, the SMEs, and maybe a developer. Even when instructional design models and approaches are more flexible and iterative, we are left with a very vague idea of the realities instructional designers live in the workplace. Models focus on a very specific concept of instructional design, usually a decontextualized one.

On the hand, the concept of an instructional design ecology gives us a new perspective on the actual practices of instructional design in the workplace as it amplifies our views of the instructional design process. In this case study, we observed beyond

theories, models, methods, and techniques. We observed a dynamic system in which the interrelationships among its agents and the environment constructed and re-constructed the realities of design practices. We observed design decisions based on assumptions, design practices based on prior knowledge, and problem-solving based on expertise. At the same time, we observed uncertainty, unpredictability, hesitation, struggles, disruption, interruption, cessation, resiliency, adaptation, and self-organization. We saw that inflexible top-down hierarchies can hinder the design flow. We also saw that disconnected bottom-up practices can stray away from the goals of the larger system and cause inefficiencies.

The participant of this study described several examples of the dynamics of an instructional design ecology based on her own experiences:

> I think it depends. You can have those really structured steps. But if you get too tied into that and say well "we're in the design phase and not the analysis phase anymore," you can get too tied to the process, and lose sight of what the point is. It's not to just get it done and out there, you know? I mean, I want to learn about what I'm doing. And I want to know who is going be the one to validate what I'm doing, or who I can talk to, or how I can get my head wrapped around it. So for me, from a little tiny project to a larger project, it's really talking to people, and researching and so forth, and then going in to start mapping out. I like those content mapping tools to start outlining things and [. . .] what that would look like, if that makes sense, and sort of structuring it in my mind. With the idea that things could continue to change, you know. I would say that creating the design plan and so forth is part of the process, but sometimes you don't know until you get into it. The actual

content is like, “okay, I put together this really perfect outline, but once I got into it, that’s not [it].” You have to be flexible on that iterative process. I want to put down—from what I know now, this is what I think. Once I get deeper in, then that might adjust a little bit, you know? And that objective might even adjust a little bit. So I always struggle a little bit. I was thinking of my last place. It was like, these are high level objectives. But when you get into the course objectives, do these translate to the actual content? Do you need to adjust going backwards? And this was something that happened in my last place—adjust objectives. It was like everybody had to come back into a design objectives meeting. We had to all agree on it. And it was just like, you know, this isn't anybody’s fault. It’s like, you do what you can with what you know. And then, further in, you're going to continue to finalize and perfect it. And then, “oh, I thought this would be one course, but it’s actually two.” You know? That kind of thing. And just relying a little bit on your expertise as well as validating it with people that would know, not just people that you feel comfortable showing it to, you know?

I've had the experience of getting to think “ah, we’re done.” And then hearing from the stakeholders, “this isn't aligned with what we really need [the learners] to do.” And having to go back, and then having the end product so much better, right? So being careful. Not like scope creep so much, like, “we're going to add this whole new thing.” But like, are we still going in the right direction? And if not, then you need to adjust. And I try to think about, “is there a way that this can be effectively evaluated, or how will we know how this is successful?” And I think that's still a

> process trying to get that to be more of a part of the [instructional design] process. And then, once you get a little bit more into development, I feel like it starts to, like, I've got the SME reviews, and I need to develop. And some things kind of adjust, and some things do break apart. But I also need to put into the time frame. So it gets a little bit more sort of rolling at a certain point. And then, you know, iterating on that and the feedback that you get. And then, moving into actual implementation. But that's what I would say. I think it depends on the project. You have an overall sort of direction you're going, but you've got to be flexible. Otherwise, if your craft is more important to you than the learners' experience and the learning, right? It needs to be efficient. And does it need to be drawn out? But you need to be involved and adaptable, I would say. (Participant's description of how she goes about designing in response to question number two of the first interview)

Through rich descriptions, this study demonstrated that procedural steps, techniques and strategies cannot depict the instructional design process. The instructional design process is a complex activity. It exists in a rich and complex ecosystem in which instructional designer, learners, product being designed, and environment interact with one another forming an ecology that is constantly adapting and evolving. This study presented one single context of instructional design. As a case study, it is not intended to provide generalization. Thus, the only way to truly know how instructional design ecologies perform is by observing a variety of them live so that we may speak to their diversity and dynamics.

Limitations

When planning this study, I wanted to capture the instructional design process from beginning to end in a real-world setting. Although I believe that is one of the strengths of this research study, I also knew it would be a risk. I knew I would be unable to control the setting. My goal was to get the necessary approvals and start observing the first design project assigned to my participant. And so, I did. And as a result, I had to observe a project that was unique in many ways.

The redesign of curriculum X was a massive enterprise. Besides having an entire curriculum redesigned, the project was part of a much larger initiative called Shared Ownership. Shared Ownership had been envisioned as a solution to resolve issues of efficiency. It was a response to an immediate need—migrate all courses for call center representatives from an old learning management system to a new learning content management system. Yet, it would also be the long-term strategy for supporting yearly call center new hire training initiative.

The learning and development (L&D) organization was trying new things. The leaders of the organization were learning as the project evolved. It was the perfect example of a complex environment. But it also put curriculum X redesign effort, and therefore, my research at risk. There were many unknowns; more than there usually is. Negotiations were still happening. Curriculum X was living in a very unstable environment. In parallel to the Shared Ownership initiative, there was also an organizational restructuring being considered. And then, the unexpected happened. The instructional designer leading curriculum X redesign effort was promoted to instructional design team leader. The entire

instructional design team would report to her. Many instructional designers changed roles, and a group of instructional design contractors were hired to support the redesign of all curricula under Shared Ownership, including curriculum X.

During the initial transition period, there was moment of silence. And I felt it was necessary to give my participant room to adapt to her new role and reality. At the same time, I did not know what was happening to the project. I waited for a week, and then I reached out to the participant to know what was happening. She informed me that she had not done much for curriculum X redesign because she was busy going through mandatory company trainings to become a manager. She was also meeting with the design teams' manager (the manager of the instructional design and instructional media teams) to learn more about her new role, expectations and projects.

With the change in project management, curriculum X redesign seemed to be moving forward again. However, it was difficult for me to have access to data. I was not being included in meetings as I was before the instructional designer's promotion. I sent emails and friendly reminders, but that did not change my access. The project manager was more inclusive, tough. I started to depend on her to get back into observing the project. She added me to important curriculum X team meetings, such as the plan of record internal review as well as the plan of record presentation to stakeholders. I was also included in major instructional design status updates for Shared Ownership. And that was when I started to hear directly from the instructional designer again.

With the instructional designer's transition to her new role, I may have missed important information about curriculum X's redesign. Although the instructional designer

was not as involved in the project as before, watching her bring the instructional designer contractor into curriculum X redesign would likely have revealed insights into her vision and perceptions of the project. In addition, I did not observe her connect with the regional design partners as she was preparing to redesign her final deliverable, a course initially called “Understanding Your Role.” I have some email exchanges that painted the picture of how she went about designing that course, and also the feedback she received online. However, live conversations were missed. And those would have likely yield rich data at the course design level.

Implications

Based on the previous sections, this case study demonstrates that the process of instructional design in the real world differ from what prescriptive models of instructional design recommend we follow. It also goes beyond the concepts what more flexible and iterative instructional design models and approaches offer. I set out to find out how an experienced instructional designer went about designing from project intake to designed product. I found that there is a big gap between theory and practice. Although instructional design process models and approaches inform the instructional design process at a microlevel, a lot of information about the design process is left undiscovered and unexplored if the instructional designer education is based solely on models and approaches. I found that models and approaches of instructional design alone do not address the skills necessary for an instructional designer to be successful in a work setting. I found that instructional design models and approaches alone do not offer the skills

necessary for instructional designers to navigate the complexities of instructional design environments and projects.

Based on those findings, I see implications for (1) future instructional design research, (2) instructional design education programs, and (3) instructional design practices.

FUTURE INSTRUCTIONAL DESIGN RESEARCH

Some of the literature reviewed in this study stated that instructional design practices in the real world differ from theories of the instructional design process, and that we need more research in instructional design *in situ* to understand what instructional designers actually do. Although this study observed a case that is probably not the most common instructional design environment, the findings corroborated what the literature claims.

Conceptual research in instructional design does not answer the question of what instructional designers do. Self-reporting studies of how instructional designers design have not been able to describe the richness of instructional design realities. Thus, this descriptive case study suggests new possibilities for future research in instructional design. It offers a new example of how instructional design might be observed "in the wild" (Hutchins, 1995). By presenting a descriptive case study of real-world instructional design, I have attempted to show some of the realities of instructional designers in the workplace, and how instructional design is a context situated practice that can only be understood when depicted within its environment. In addition, by selecting complex systems as a lens through which to observe the instructional design process, I have demonstrated that

instructional design is an ecology of instructional designer, learners and product being designed, and that those elements are interdependent, dynamic and adaptive, and they shape and are reshaped by their environment.

I believe the framework I have utilized provided a robust platform from which to observe the instructional design process in the real world and on which to build knowledge of it. The complex systems attributes I have selected—distribution, emergence, embodiment, and enaction—were my personal choice. Yet, theories of complexity offer a variety of concepts that can be explored within an ecology of instructional design. Also, as I see it, this research provided a brief synthesis of those attributes. But if I were to deep dive into each concept within the data I collected, I would have one research article for each.

In the end, I refrain from trying to summarize what instructional designers do in one paragraph. That would compartmentalize the instructional design process and instructional design practices in a way that would go against this entire case study. I do invite instructional design researchers to join me in this effort to temporarily immerse themselves in an instructional design environment and use a variety of data sources to examine and write the story of what instructional designers do in diverse contexts. Any project observed, be it a small or large scale project, will offer the missing contexts of instructional design that the literature needs. As long as we use rich descriptions to tell the story from beginning to end, we will be able to build a library of examples. We need a variety of cases to show the dynamics of the instructional design process *in situ* and inform instructional design students and professionals of real-world practices.

INSTRUCTIONAL DESIGN EDUCATION PROGRAMS

To offer instructional designers knowledge of learning theories and several instructional design models and approaches, and send them into the real world would be like sending a surgeon into an operating room with some theories and surgical instruments and expect that surgeon not to kill the patient. Instructional design cannot be perceived as a simple job. This case study was an attempt to start a conversation about how we might prepare our instructional designers for the workplace. How can instructional design programs rethink their curriculum to offer their students a perspective of instructional design that better prepares them for the realities of the real world? Beyond instructional design models and approaches, what types of skills will ensure instructional designers are well prepared to navigate the dynamics of an instructional design ecology? What types of skills do instructional designers need to be successful at designing high quality learning products and environments?

In this study, I observed one instructional designer coordinate the instructional design process in a dynamic environment. The instructional design process evolved over a period of time, and the instructional designer influenced that process and was shaped by it, learning to adapt to different strategies throughout the journey. We saw the instructional designer take a back seat at times and listen, talk, be more direct and directive at other times, ask questions, collaborate, coordinate, communicate, project manage, time manage, research, analyze materials, synthesize information, organize thoughts, problem solve, make decisions, outline, content map, create, write, revise, rewrite, make assumptions, deconstruct her assumptions, hesitate, feel stuck, empathize, and so much more. There were

signs of anticipation, moments when her previous experiences informed her actions and reactions, but none of the process or the instructional designer's approach could have been predicted. So, is instructional design such a predictable practice that we will always know the next step in advance? I do not think so. Instructional design models and approaches are important to paint a general picture of the phases or steps of the instructional design process. But they cannot be the only tool in an instructional designer's toolbox. No one instructional design model or approach would have been the solution for or the answer to the case we observed.

We know that instructional design programs will not be able to replicate the exact realities of the workplace and the breadth of instructional design contexts. However, we can provide our students more robust frameworks of knowledge, and a variety of cases to be studied and discussed so that they can have a better understanding of what awaits them outside school. We can consider adding project management skills or a partnership with the School of Business, for example. We can also consider class assignments that help instructional designers develop better writing and communication skills. Instructional design students must be able to listen, make connections, and ask very specific questions. We can also offer more realistic environments where the students have to grow some "thick skin" to receive feedback without taking it personally. We must provide resources for students to understand the target audience beyond a list of learner characteristics. We need them to develop empathy for the target audience and their realities.

Instructional design education programs have the responsibility to reduce the gap between theory and practice and offer novice instructional designers better understanding

of the ecologies in which they will be active agents. When that is achieved, the quality of design products will also be impacted. Having said that, the considerations above are not a criticism of instructional design programs. Evaluation of instructional design programs is beyond the scope of this study. Instead, the observations above are intended to inspire ideas and initiate dialogs. This case study simply presents one context of instructional design; a complex and dynamic one that cannot be explained or summarized by instructional design models and approaches. Is your instructional design program preparing novice instructional designers to succeed in those types of environments?

INSTRUCTIONAL DESIGN PRACTICES

There are many paths to becoming an instructional designer. As Merrill (in Reiser & Dempsey, 2007) pointed out, the majority of instructional designers become instructional designers by assignment. Others receive some kind of certification through a short-term program. Still, a minority go through 2 years of a master's degree and 4 years of a Ph.D. program. No matter the path taken, the demands of instructional design practices in the workplace differ significantly from the traditional literature, what is described in the some school curricula, some classroom projects, and even some informal resources utilized by instructional designers by assignment as they try to solidify their practices in sound conceptual knowledge bases.

As instructional designers, we go into the real world armed with knowledge of the steps that must be followed, even if at a very high level: analysis, design, development, implementation and evaluation. And as we try to implement those steps, the worlds of theory and practice collide leaving us struggling to follow the process "correctly"—the

way we were taught, the way we practiced in school, the way we know is right because it is the foundation of the field, the way that seems to be common sense to a lot of instructional designers.

There are many models of instructional design process, and theories and frameworks for instructional design practices in the literature. And as newer theories try to solve for the "weaknesses" of ADDIE models by including concepts of cycles, iterations, motivation, content organization, empathy, discovery, scenarios, apprenticeship, spirality, transactionality, and prototyping to name a few, they all fall into the same category: micro-level perspectives of instructional design. And by offering micro-level perspectives, they focus on very specific concepts—the process steps, the product being designed, the learner characteristics, and even the environment for which the product is being designed (e.g. face to face versus online). And although all those theories offer important tools for the instructional designer knowledge toolbox, at their level of specificity, they do not describe contexts of instructional design. They are not complete solutions to the complex problems instructional designers encounter in the workplace. And once again, professional instructional designers are left to solve problems and make decisions by using those very specific tools in situations that may require a completely different tool set.

To conclude, I will not recommend one single instructional design model or a few instructional design models for instructional design practices. I believe all the work that has come before this research study has merit, and many of the models, approaches and frameworks can serve a purpose during the instructional design process. What I can say is that the instructional design process is a complex, non-linear, dynamic practice. In an

ecology of instructional design, we may observe agents actively adapting to their situational contexts to be able to "survive" and thrive in the environment. They may have to navigate through a web of intricacies, woven by internal and external structures and hierarchies, by coordinating with project team members and other elements of and in the situational contexts in which they must function. In the instructional design process observed in this study, we saw exactly that.

Appendices

APPENDIX A - INTERVIEW QUESTIONS

Interview 1 - Administered before the project kickoff meeting

1. In your opinion, what do instructional designers do?
2. How do you go about designing from the intake form to designed product?
3. What types of knowledge or skills do you need as an instructional designer?
4. What instructional design theories/models do you typically use for your design practices?
5. When, during the instructional design process, do you typically define the problem?
6. How do you usually define the problem?
7. If you do not have complete information about the problem from the beginning, how do you go about designing a solution?
8. How do you usually come up with a design solution?
9. What types of information (or what factors) impact your design decisions/practices/process?
10. What design practices/techniques/strategies do you typically use that are effective for you as an instructional designer?
11. What common problems/challenges/constraints impact your design decisions/practices/process?
12. When you encounter design challenges, or when you feel stuck, where do you go for help?
13. Considering the instructional design process from intake to designed product, how do you use tools and technologies to support your design practices?
14. Is there anything you would like to add regarding how you go about designing a learning product?

Interview 2 - Administered after the final deliverable

1. In this project, how did you go about designing from intake form to designed product?
2. What types of knowledge or skills did you use as an instructional designer in this project?
3. What instructional design theories/models did you use in your design practices in this project?
4. When, during the instructional design process, did you define the problem?
5. How did you define the problem?
6. If you did not have complete information about the problem from the beginning, how did you go about designing a solution?
7. How did you come up with a design solution?
8. What types of information (or what factors) impacted your design decisions/practices/process?
9. Were there particular points when new information came into play?
10. What design practices/techniques/strategies were effective for you in this project?
11. What problems/challenges/constraints impacted your design decisions/practices/process?
12. When you encountered design challenges, or when you felt stuck, where did you go for help?
13. Considering the instructional design process from intake to designed product, how did you use tools and technologies to support your design practices?

14. What technical skills did you use in this project?
15. Is there anything you would like to add regarding how you went about designing a learning product?
16. How might the participation in this study have impacted you as an instructional designer or your designed product?

APPENDIX B - PARTICIPANT OBSERVATION FIELD NOTES GUIDE

Setting

Date:

Project:

#Participants:

Observation Start Time:

Observation End Time:

Distribution

- How is information distributed among the project team members?
- How does the instructional designer distribute the instructional design process among the technologies?
- What cognitive activities have been "offloaded" from individuals to the physical environment (e.g. whiteboard, technologies)?
- How does the environment impact the distribution of work? Or what cognitive capacities are assumed by the design of the physical environment?
- How is the physical environment arranged or designed to guide people's interactions with the environment and with each other?
- What tools are available, if any?

Emergence

- At the time of kick-off meetings: What are the elements that impact the design decisions at the start of the project?
    - Project information
    - Team members or assigned roles
    - Physical environment—for the instructional designer, the product being designed or for the target audience.
    - Deadlines or historical information that may impact the dynamics of this system at the start of the project.
- After kick-off meetings: What new elements impact the design decisions?
    - Information—new business decisions or requests, new information regarding the target audience, new content.
    - New team members or reassigned roles
    - New physical environment—for the instructional designer, the product being designed or for the target audience.
    - New deadlines or finding out historical information that impacts the dynamics of this system in the present.
- And how do those changes affect the instructional design process?
- Are there signs of anticipation—the instructional designer made decisions based on previous experiences? How did anticipation impact ecology of instructional design?

Embodiment

- What gestures are observed? What do the gestures suggest? How might they impact the relationships within the system or be influenced by it?
- How do people position their bodies relative to each other or to the physical environment? Or, how are they grouped? Is this an indication of the relationships within the system?
- How do participants interact with any tools they have access to (e.g. computers, smartphones, pen, paper)? Is the instructional designer taking notes?
- How do their sensorimotor skills impact the design process?
- Are there new project team members? How do new team members impact the dynamics of the instructional design process?
- Who are the participants and what roles are they assuming in the meeting?
- What expressions of emotion are observed? How can you tell?

Enaction

- What actions/solutions does the instructional designer take in response to changes related to information about the project, environment of the learners, and other project changes?
- What cognitive processes can be identified (e.g. memorization, listening, reading, writing, decision-making, problem-solving, reasoning)?
- How does the instructional designer change the product being designed as a response to changes in the project (e.g. examples of adaptation)?

APPENDIX C - EMAIL FROM INSTRUCTIONAL DESIGNER WITH MEETING NOTES

Subject: Summary of 08/23 meeting

Hey Laise!

I forgot to send you a summary of yesterday's meeting and wanted to get it to you before we meet today.

Basically, [the instructional design team leader] and I chatted a bit yesterday about New hire in general and then about [curriculum X].

After taking a look at the curriculum, I saw that there were 43 courses and we chatted about how we are concerned as to how this, or any of the other curricula could be completed and moved into the learning app/new templates/etc.

We also talked about how this project will also be using the federated model, with our team working with the "What and Why" of the content (overviews, strategy, etc.) and [call center partner] teams would be working with the "How and When" of the content (practice activities, process, tools, etc.).

We talked about what was most important, getting the material into the Learning app as is (but in new templates) and just dividing up the existing materials between [call center] and us, or taking a look at it closely and determining what needs to really be redesigned.

We determined that the content as is can't be plugged into the learning app. The SGTs [self-guided training] are 30min to 1hr long. That is just not our approach anymore. So the idea is to look at how we can redesign those experiences and where can we determine the ILTs [instructor-led training] that need redesign and those that just go as is.

So, I decided after this meeting, instead of just saying which courses I would do and which ones that [call center partners] would do, was that I would take a look at the content/topics/objectives and categorize them by “What and Why” and “How and When” to get us closer to seeing what elements would be in our realm and where we hand off to [call center partners].

In the next meeting, I’m going to share with [the instructional design team leader] what I have so far and see if that aligns with the overall New Hire strategy.

Talk to you soon!

[instructional designer’s name]

APPENDIX D - FIRST VERSION OF CONTENT ANALYSIS MAP PRESENTED

Skills/Topics			
What and Why	**How and When**	**Relevant existing courses/objectives**	**Ideas for Redesign of L&D owned content**
Understanding the role of the [X Call Center Representative] - value of this role to the organization, to our customers - overview of skills that are necessary be successful (investigative, comparing/contrasting data, being able to make a decision based on relevant research and analysis)		Intro to [X Call Center Representative] role	Classroom discussion and fun intro activity (use investigative skills in classroom) - Interview/role video of existing [X Call Center Representative] on why they do what they do. Use existing video on impact of [X call center representative] (get a list of [Media Manager]) - putting together a process on updating videos
Overview of [Online Order] Review model why this model is valuable/useful what is the outcome of using this model	How to apply model during interactions with customers (scenarios, practice, and reinforcement) - throughout the curriculum	[Online Order] Review Model SGT	Animation/Infographic/Image with tags to represent [online order] review model (facilitated experience with virtual participant guide?),

- Intro to [xyz] as tool to use for [order] review Screen tour demo (overview and then each step)	Using UAT for ac Procedure review activities	Existing simulations	access to [xyz tool] for participants? or overall demo? - discussion with [Tools' Manager] on how we can improve systems training
Overview of Case Overview - defining this step - why this is the first step - surveying the case to learn who, what, and how - defining data points	How to conduct a case overview – how to assess who, what, and how (Strategies in tool) Practice reviewing data points (good or suspicious) (Practice, procedure review) Practice reviewing sample case overviews	Overview of Case Overview (Cut threaded case?)	Short SGTs introducing step, intro [xyz tool] (demo? short simulation/animation?) Classroom discussion on the what and why
Overview of Research Step - purpose of research step - list and define data points to research - differences between current case data research and case history research	Deeper dive into research experience in xyz Using tools to research (demonstration) Practice researching data points Practice research current case data Practice research case history	Elements of Research (also practice research courses)	Short SGTs introducing step, [xyz tool] research simulation? (demo? short simulation/animation?) Classroom discussion on the what and why
Overview of Confirm Step - purpose of confirm step - identify outbound communications skills needed for this step (with inst./customers)	Practicing customer outreach	Elements of Confirm (also practice confirm courses)	Short SGTs introducing Confirm, activity around skills, use the existing video on outbound communication?

Overview of Analyze Step - purpose of analyze step [removed] - Determining [different types of] cases - Useful behaviors and actions - Overall steps and data points to analyze	Practice analyzing results of case research (case examples)	Elements of Research (also practice research courses)	Short SGT introducing, Classroom discussion around behaviors and data points to analyze
Overview of Decision Action Step - purpose of decision/action step - overview of strategies used to make decision	Steps to take in XYZ to [action] case. (Procedure activity) Practice taking action on a case [Customer Service Tool] tasks (Procedure activities?)	Elements of Research (also practice research courses)	Short SGT introducing, Classroom discussion around strategies
Specialist Performance/Quality Assurance (Does this need to be taught in the new hire) - could this one be a few weeks/months out??? Instead, during new hire - could there be a Getting Started in your role, how to be successful/tips/behaviors, etc.	same question		shadowing
Unsure about the [X Process] / [Customer Service tool] content….			customer data – using [GDPR approved] fake customers

APPENDIX E - CONTENT ANALYSIS MAP UPLOADED ONTO SERVER AT THE END OF DAY

See Appendix E as attached pdf file.

APPENDIX F - CONTENT ANALYSIS MAP EMAILED TO INSTRUCTIONAL MEDIA SPECIALIST BY INSTRUCTIONAL DESIGNER

See Appendix F as attached pdf file.

APPENDIX G - CONTENT ANALYSIS MAP PRESENTED ON THIRD WEEK OF ANALYSIS PHASE

See Appendix G as attached pdf file.

APPENDIX H - LAST VERSION OF CONTENT ANALYSIS MAP

See Appendix H as attached pdf file.

APPENDIX I - INSTRUCTIONAL DESIGNER'S FOLLOW-UP EMAILS TO SMES

Email 1

Subject: Thanks and follow up questions – [Potential Target Audience 1]

Hey [SME],

It was nice to meet you virtually and we appreciate you giving us some background on the current training and support [Potential Target Audience 1 Call Center Representatives] receive. I wanted to send a few follow up questions:

- Could you share with us the training that you have used to train new hires on your team?
- Could you give us 3-4 critical behaviors you expect your new [Call Center Representatives] to be [able to] do on the job (1-2 particular to [Potential Target Audience 1])
- I will send you a link to the current videos that we have for the [Curriculum X]. Could you review and let us know of any red flags/areas that may not be relevant to your audience?
- Could you give a description of the type of support you provide post-training event (shadowing, touch base, feedback, QA)?
- Identify 3-4 key procedures that your team uses

Thanks and look forward to talking further.

[ID]

Email 2

Subject: Thanks and follow up questions – [Potential Target Audience 2]

Thanks again [SME] for meeting with us yesterday and thanks for getting us access to the [Potential Target Audience 1 Online] space. I wanted to send a few follow up questions.

- Would you be able to share the [Potential Target Audience 2] training that you currently use for new hires?
- Are there any particular processes on the [Potential Target Audience 2] site that you would recommend reviewing (high priority processes)?
- Could you give us 3-4 critical behaviors you expect your new [Call Center Representatives] to be [able to] do on the job (1-2 particular to [Potential Target Audience 1])
- You mentioned that [Person's Name] in [City in the Americas] would be a good contact in [City in the Americas], as he developed the training? Would we be able to reach out to him directly?
- I will send you a link to the current videos that we have for the [Curriculum X]. Could you review and let us know of any red flags/areas that may not be relevant to your audience?

Thanks and look forward to talking further.

[ID]

Email 3

Subject: Thanks and follow up questions – [Curriculum X Original Target Audience]

Hi SME,

Thanks again for meeting with us today. I wanted to send a few follow up questions.

- Could you send along the condensed version of the [Curriculum X] training that you have used for new hires?
- Could you give us 3-4 critical behaviors you expect your new [Call Center Representatives] to be [able to] do on the job?
- I will send you a link to the current videos that we have for the [Curriculum X]. Could you review and let us know of any red flags/areas that may not be relevant to your audience?
- Could you give a bit more description of the type of support you provide post-training event (shadowing, touch base, feedback, QA)?

Thanks and I look forward to talking further.

[ID]

APPENDIX J – SMES' RESPONSES TO INSTRUCTIONAL DESIGNER

SME 1 Response

Subject: Re: Thanks and follow up questions – [Potential Target Audience 2]

Hi [ID],

- Would you be able to share the [Potential Target Audience 2] training that you currently use for new hires?

The email was sent on 21 Sep including our latest version of [Potential Target Audience 2] **training deck [Potential Target Audience 2 Curriculum] [New Hire Training] 2018, hope you are able to [download] it.**

- Are there any particular processes on the iTunes ConnectMe site that you would recommend reviewing (high priority processes)?

You may review Process Docs and tools [link]. It includes our SOPS and Guidelines. Also introduce the tools that we are using : ACM and MZ.

- Could you give us 3-4 critical behaviors you expect your new [Call Center Representatives] to be [able to] do on the job (1-2 particular to iTunes Fraud Prevention)

- Excellent analytical skills & extensive investigative and research

- Attention to detail

- Strong decision making & judgment

- Critical thinking and self motivation

- You mentioned that [Person's Name] in [City in the Americas] would be a good contact in [City in the Americas], as he developed the training? Would we be able to reach out to him directly?

[Person's name] developed the training deck. He is currently on his rotation in [another] team, I will confirm with [my manager] whether [Person's name] can be reached out.

- I will send you a link to the current videos that we have for the [Curriculum X]. Could you review and let us know of any red flags/areas that may not be relevant to your audience?

I will review this when I get access of [Server] and reply you ASAP.

Kind regards,

[SME's name]

[Potential Target Audience 1] Team Lead

SME 2 Response

Subject: Re: Thanks and follow up questions – [Curriculum X Original Target Audience]

Hi All,

Hope everyone is doing well.

Following on from Last weeks email I have included a Word document with the condensed version of the [Curriculum X] content I used with the new Supervisor.

In terms of critical behaviours we would commonly associate with new [Call Center Representatives] then I would say they need to be able to showcase what they have learned throughout the Training, they need to have good listening skills, they would need to have good attention to detail and they need to be able to have effective/efficient problem solving skills.

I reviewed the 4 videos that were sent and there were just a small few bits that could be changed. The first video has a screen recording of the tool [name of the tool]; we no longer have access to this so new [Call Center Representatives] wont be using this. The Second video was ok. The Third video had no sound for me to listen to but I have listened to it already numerous times and it is ok. The Fourth video has [old procedure document website] and an [old procedure website] article pop up which again we no longer will be using.

Usually the [Call Center Representatives] would partake in Grad bay for one week after

the commencement of their training followed by them graduating to the “floor”. This is achieved through them passing the Accreditation. There is always support provided for new hires thereafter through the QA, touching base to see how they are doing and 2nd looks. Shadowing would take part during the training usually as we have time for that.

[Removed attachment]

Kind Regards,

[SME’s name]

[X Call Center Representative]

References

Association for Talent Development. (n.d.). *What is instructional design?* Retrieved September 21, 2020, from https://www.td.org/talent-development-glossary-terms/what-is-instructional-design

Banathy, B. H. (1968). *Instructional systems*. Belmont, CA: Fearon Publishers.

Barr, R. B. & Tagg, J. (1995). From teaching to learning: A new paradigm for undergraduate education. *Change*, *27*(6), 13-25.

Bateson, G. (1972). *Steps to an ecology of mind*. New York, NY: Chandler Publishing Company.

Bersin, J. (2008). The High Impact Learning Organization, Bersin & Associates Industry Report. V. 1.0.

Boling, E., Alangari, H., Hajdu, I. M., Guo, M., Gyabak, K., Khlaif, Z., Kizilboga, R., Tomita, K., Alsaif, M., Lachheb, A., Bae, H., Ergulec, F., Zhu, M., Basdogan, M., Buggs, C., Sari, A. & Techawitthayachinda, R. I. (2017). Core judgments of instructional designers in practice. *Performance Improvement Quarterly*, *30*(3), 199-219.

Boulding, K. E. (1981). *Ecodynamics: A new theory of societal evolution*. Beverly Hills, CA: Sage Publications.

Campbell, K., Schwier, R. A. & Kenny, F. R. (2015). Conversation as inquiry: A conversation with instructional designers. *Journal or Learning Design*, *8*(3), 46-65.

Cennamo, K. & Kalk, D. (2005). *Real world instructional design*. Belmont, CA: Thompson Wadsworth.

Christensen, T. K. & Osguthorpe, R. T. (2004). How do instructional-design practitioners make instructional-strategy decisions? *Performance Improvement Quarterly*, *17*(3), 45-65.

Cole, M. & Engeström, Y. (1993). A cultural-historical approach to distributed cognition. In G. Salomon (Ed.), *Distributed cognitions: Psychological and educational considerations*. (pp. 1-46). Cambridge, UK: Cambridge University Press.

Dick, W., Carey, L. & Carey, J. O. (2005). *The systematic design of instruction* (6th ed.). Boston, MA: Allyn and Bacon.

Dicks, D. & Ives, C. (2008). Instructional designers at work: A study of how designers design. *Canadian Journal of Learning and Technology*, *34*(2), 91-108.

Ertmer, P. A. (2005). Teacher pedagogical beliefs. The final frontier in our quest for technology integration. *Educational Technology Research and Development*, *53*(4), 25-40.

Fink, L. D. (2003). *Creating significant learning experiences: An integrated approach to designing college courses*. San Francisco, CA: Jossey-Bass.

Fleck, L. (1979). *Genesis and development of a scientific fact*. (F. Bradley & T. J. Trenn, Trans.). Chicago, IL: The University of Chicago Press. (Original work published in 1935).

Gerin-Lajoie, S. (2015). Being an instructional designer: A job requiring innovation. *Canadian Journal of Learning & Technology*, *41*(3.1), 1-28.

Gibbons, A. S. (2003). What and how do designers design? A theory of design structure. *TechTrends*, *47*(5), 22-27.

Gibbons, A. S. (2011). Contexts of instructional design. *The Journal of Applied Instructional Design*, *1*(1), 5-12.

Gibbons, A. S. (2014). Essay: Applied instructional design. *The Journal of Applied Instructional Design*, *4*(1), 73-77.

Gustafson, K. L. (2005). Foreword. In Cennamo, K. & Kalk, D. *Real world instructional design*. (pp. xii). Belmont, CA: Thompson Wadsworth.

Holland, J. H. (1995). *Hidden order: How adaptation builds complexity*. New York, NY: Addison-Wesley.

Holland, J. H. (2006). Studying complex adaptive systems. *Journal of Systems Science and Complexity*, *19*(1), 1-8.

Honebein, P. C. & Sink, D. L. (2012). The practice of eclectic instructional design. *Performance Improvement*, *51*(10), 26-31.

Hutchins, E. (1995). *Cognition in the wild*. Cambridge, MA: The MIT Press.

Jonassen, D. H. (2008). Instructional design as design problem solving: An iterative process. *Educational Technology*, *48*(3), 21-26.

Kenny, R. F., Zhang, Z., Schwier, R. A., & Campbell, K. (2005). A review of what instructional designers do: Questions answered and questions not asked. *Canadian Journal of Learning and Technology*, *31*(1), 9-26.

Kirschner, P., Carr, C., & Merriënboer, J. V. (2002). How expert designers design. *Performance Improvement Quarterly*, *15*(4), 86-104.

Lave, J. (1988). *Cognition in practice: Mind, mathematics and culture in everyday life*. Cambridge, UK: Cambridge University Press.

Le Dantec, C. A. (2009). Situated design: Toward an understanding of design through social creation and cultural cognition. *Proceedings of the seventh ACM conference on creativity and cognition*, 69-78, doi: 10.1145/1640233.1640247.

Lincoln, Y. S. & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage Publications.

Marshall, C. & Rossman, G. B. (2006). *Designing qualitative research* (4th ed.). Thousand Oaks, CA: Sage Publications.

Maturana, H. R. & Varela, F. J. (1980). *Autopoiesis and cognition: The realization of the living*. Dordrecht, Holland: D. Reidel Publishing Company.

Maturana, H. R. & Varela, F. J. (1992). *The tree of knowledge: The biological roots of human understanding* (Revised edition). Boston, MA: Shambhala Publications.

Meadows, D. H. (2008). *Thinking in systems: A primer*. White River Junction, VT: Chelsea Green.

Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation* (Revised and expanded from Qualitative Research and case study applications in education). San Francisco, CA: Jossey-Bass.

Merrill, M. D. (2007). The future of instructional design: The proper study of instructional design. In R. A. Reiser & J. V. Dempsey (Eds.), *Trends and issues in instructional design and technology* (2nd ed.). (pp. 336-341). Upper Saddle River, NJ: Pearson Education, Inc.

Nardi, B. A. & O'Day, V. L. (1999). *Information ecologies: using technology with heart*. Cambridge, MA: The MIT Press.

Patry, A., Brown, E. C., Rousseau, R. & Caron, J. (2015). Evolution of the Instructional Design in a series of online workshops. *Canadian Journal of Learning & Technology*, *41*(3.1), 1-23.

Patton, M. (1990). Qualitative evaluation and research methods (pp. 169-186). Beverly Hills, CA: Sage.

Pea, R. (1993). Practices of distributed intelligence and designs for education. In G. Salomon (Ed.), *Distributed cognitions: Psychological and educational considerations*. (pp. 47-87). Cambridge, UK: Cambridge University Press.

Reigeluth, C. M. (1983). Instructional design: What is it and why is it? In C. M. Reigeluth (Ed.), *Instructional design theories and models: An overview of their current status.* (pp. 3-36). Hillsdale, NJ: Laurence Erlbaum Associates, Publishers.

Reiser, R. A. (1987). Instructional technology: A history. In R. M. Gagné (Ed.), *Instructional technology: Foundations*. (pp. 11-48). Hillsdale, NJ: Laurence Erlbaum Associates, Publishers.

Reiser, R. A. (2001). A history of instructional design and technology: Part II: A history of instructional design. *Educational Technology Research and Development*, *49*(2), 57-67.

Reiser, R. A. (2018). What field did you say you were in? In R. A. Reiser & J. V. Dempsey (Eds.), *Trends and issues in instructional design and technology* (4th ed.). (pp. 1-7). New York, NY: Pearson Education.

Richey, R. C. (1998). The pursuit of useable knowledge in instructional technology. *Educational Technology Research and Development*, *46*(4), 7-22.

Rowland, G. (1992). What do instructional designers actually do? A initial investigation of expert practice. *Performance Improvement Quarterly*, *5*(2), 65-86.

Rowland, G. (1993). Designing and instructional design. *Educational Technology Research and Development*, *41*(1), 79-91.

Saettler, P. (1968). *A history of instructional technology*. New York, NY: McGraw-Hill.

Salomon, G. (1993). No distribution without individuals' cognition: A dynamic interactional view. In G. Salomon (Ed.), *Distributed cognitions: Psychological and educational considerations*. (pp. 111-138). Cambridge, UK: Cambridge University Press.

Sharif, A., & Cho, S. (2015). 21st-century instructional designers: Bridging the perceptual gaps between identity, practice, impact and professional development. *Universities and Knowledge Society Journal*, *12*(3), 72-85.

Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. New York, NY: Basic Books.

Silber, K. H. (2007). A principle-based model of instructional design: A new way of thinking about and teaching ID. *Educational Technology*, *47*(5), 5-19.

Sugar, W. & Moore, R. L. (2015). Documenting current instructional design practices: Towards a typology of instructional designer activities, roles, and collaboration. *The Journal of Applied Instructional Design*, *5*(1), 51-59.

Syverson, M. A. (1999). *The wealth of reality: An ecology of composition*. Cardondale, IL: Southern Illinois University Press.

Varela, F. J., Thompson, E. & Rosch, E. (1993). *The embodied mind: Cognitive science and human experience*. Cambridge, MA: The MIT Press.

Visscher-Voerman, I. & Gustafson, K. L. (2004). Paradigms in the theory and practice of education and training design. *Educational Technology Research and Development*, *52*(2), 69-89.

Waldrop, M. M. (1992). *Complexity: The emerging science at the edge of order and chaos*. New York, NY: Touchstone.

Wenger, E. (2008). *Communities of practice: Learning, meaning and identity*. New York, NY: Cambridge University Press.

Wiggins, G. & McTighe, J. (2005). *Understanding by design* (2nd ed.). Alexandria, VA: Association for Supervision and Curriculum Development.

Williams, G. S. (2016). *Empathy and the instructional designer* (Doctoral dissertation). Retrieved from BYU ScholarsArchive. 5808.

Wilson, B. G. (1995). Situated instructional design: Blurring the distinctions between theory and practice, design and implementation, curriculum and instruction. In M. Simonson (Ed.), *Proceedings of selected research and development presentations*. Washington, DC: Association for Educational Communications and Technology.

Wilson, M. (2002). Six views of embodied cognition. *Psychonomic Bulletin & Review*, *9*(4), 625-636.

Yanchar, S. C. & Gabbitas, B. W. (2011). Between eclecticism and orthodoxy in instructional design. *Educational Technology Research and Development*, *59*(3), 383-398.

Yanchar, S. C., South, J. B., Williams, D. D., Allen, S. & Wilson, B. G. (2010). Struggling with theory? A qualitative investigation of conceptual tool use in instructional design. *Educational Technology Research and Development*, *58*(1), 39-60.

Yin, R. K. (2009). *Case study research: Design and methods* (4th ed.). Thousand Oaks, CA: Sage Publications.

Young, R. A. (2008). An integrated model of designing to aid understanding of the complexity paradigm in design practice. *Futures*, *40*(6), 562-576.